WAYS AND MEANS COMMITTEE
AGENDA
TUESDAY, MARCH 6, 2012

4:00 P.M.

COMMISSION CHAMBERS, FOURTH FLOOR, BAY COUNTY BUILDING

PAGE NO.

I CALL TO ORDER

II ROLL CALL

1- 4 III MINUTES (2/7/12)

IV PUBLIC INPUT

V PETITIONS AND COMMUNICATIONS

A. Environmental Affairs and Community Development

5- 7 1. ITC Presentation **(Receive)**

8- 9 2. Update on Saginaw Bay Work Plan Activities **(Receive)**

10-21 3. Gypsy Moth Suppression Program - Millage Renewal **(Seeking approval of placement of millage renewal on August 2012 ballot - proposed resolution attached)**

22-23 B. Drain Commissioner - Soil Erosion and Sedimentation Control Standards **(Seeking Board adoption of manual - proposed resolution attached. Note: Due to size of document (188 pages) it is a separate attachment. Hard copy available for review in Board Office.)**

24-25 C. Superintendent of Buildings and Grounds - Lease Space **(Seeking authorization to lease space at Court Facility to State of Michigan for $657.00 per month; authorization for Board Chair to sign lease; approval of required budget adjustments - proposed resolution attached)**

26-27 D. Bay County Fair Board - Use of Fairgrounds for Bay County Fair **(Seeking approval of use of Fairgrounds in August for Bay County Fair activities proposed resolution attached)**

E. Health Department

28-29 1. Bay County Community Foundation Grant to support Community Health Improvement Planning (CHIP) **(Seeking authorization to apply for grant funding; authorization for Board Chair to sign required documents; approval of required budget adjustments - proposed resolution attached)**

30-31 2. Household Hazardous Waste Collection Grant from Dow Chemical Company **(Seeking authorization to make application for grant funding; authorization for Board Chair to sign required documents; approval of required budget adjustments - proposed resolution attached)**

32-33 3. Bio-Monitoring Agreement **(Seeking authorization for Board Chair to sign Agreement; approval of required budget adjustments - proposed resolution attached)**

34-35 F. Mosquito Control Director - Extension of Contract w/Clarke Aerial Treatment **(Seeking approval of contract extension; authorization for Board Chair to sign; approval of required budget adjustments - proposed resolution attached)**

36-39 G. Personnel Director - Health Care Initiative **(Seeking authorization to solicit bids for on-site wellness clinic. The CareATC publication referred to in the Personnel Director's letter is separate attachment.)**

H. Finance Director

40-42 1. Budget Adjustments **(Approval required)**

43 2. Analysis of General Fund Unreserved/Undesignated Fund Balance 2012 **(Receive)**

3. Update regarding Executive Director #2007-11 **(Receive)**

VI REFERRALS

VII UNFINISHED BUSINESS

VIII NEW BUSINESS

IX CLOSED SESSION (when requested)

X MISCELLANEOUS

XI ANNOUNCEMENTS

XII ADJOURNMENT

PLEASE NOTE: THE COMMITTEE CHAIR HAS REQUESTED THAT ANY ELECTED OFFICIAL, DEPARTMENT/ DIVISION HEAD PLACING AN ITEM ON THE WAYS AND MEANS COMMITTEE AGENDA BE PRESENT OR HAVE A REPRESENTATIVE PRESENT TO SPEAK TO THEIR REQUEST AND/OR ANSWER ANY QUESTIONS POSED BY COMMITTEE MEMBERS.

WAYS AND MEANS COMMITTEE
MINUTES

MEETING OF THE BAY COUNTY WAYS AND MEANS COMMITTEE HELD ON TUESDAY, FEBRUARY 7, 2012, IN THE COMMISSIONERS CONFERENCE ROOM, FOURTH FLOOR, BAY COUNTY BUILDING.

CALL TO ORDER BY CHAIR KRYGIER AT 4:00 P.M.

ROLL CALL:

MOTION NO.

COMMISSIONERS PRESENT:		1	2	3	4	5	6	7	8	9	10	11	12
ERNIE KRYGIER, CHRMN	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
DONALD J. TILLEY, V.CHRMN.	P	S/Y	Y	M/Y	S/Y	Y	M/Y	M/Y	Y	M/Y	S/Y	M/Y	Y
MICHAEL J. DURANCZYK	P	M/Y	Y	Y	Y	M/Y	S/Y	S/Y	S/Y	Y	Y	Y	S/Y
BRANDON KRAUSE	P	Y	S/Y	S/Y	Y	S/Y	Y	Y	Y	Y	Y	S/Y	M/Y
VAUGHN J. BEGICK	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
JOE DAVIS	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
TOM RYDER	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CHRISTOPHER RUPP	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
KIM COONAN, EX OFFICIO	P	Y	M/Y	Y	M/Y	Y	Y	Y	M/Y	S/Y	M/Y	Y	Y

MOTION NO.

COMMISSIONERS PRESENT:	13	14	15	16	17	18	19	20	21	22	23	24
ERNIE KRYGIER, CHRMN	Y	Y	Y	Y	Y	Y	Y					
DONALD J. TILLEY, V.CHRMN.	Y	S/Y	S/Y	Y	MY	M/Y	M/Y					
MICHAEL J. DURANCZYK	M/Y	Y	Y	S/Y	Y	S/Y	Y					
BRANDON KRAUSE	Y	M/Y	Y	M/Y	Y	Y	S/Y					
VAUGHN J. BEGICK	Y	Y	Y	Y	S/Y	Y	Y					
JOE DAVIS	Y	Y	Y	Y	Y	Y	Y					
TOM RYDER	Y	Y	Y	Y	Y	Y	Y					
CHRISTOPHER RUPP	S/Y	Y	Y	Y	Y	Y	Y					
KIM COONAN, EX OFFICIO	Y	Y	M/Y	Y	Y	Y	Y					

MOTION NO.

COMMISSIONERS PRESENT:	25	26	27	28	29	30	31	32	33	34	35	36
ERNIE KRYGIER, CHRMN												
DONALD J. TILLEY, V.CHRMN.												
MICHAEL J. DURANCZYK												
BRANDON KRAUSE												
VAUGHN J. BEGICK												
JOE DAVIS												
TOM RYDER												
CHRISTOPHER RUPP												
KIM COONAN, EX OFFICIO												

OTHERS PRESENT: T.HICKNER, M.GRAY, M.FITZHUGH, C.HEBERT, R.JIMINEZ, L.NORMAN, B.SHORT, T.PUTT, K.MEAD, J.STRASZ, T.ROEHRS, L.OGAR, K.PRIESSNITZ, B.DOUGLAS, A.SCHUPACK, F.ZIPPLES, A.WALLACE, R.REDMOND, BAY 3 TV, D.BERGER

M-MOVED; S-SUPPORTED; Y-YEA; N-NAY; ABS.-ABSTAIN; E-EXCUSED; A-ABSENT; W-WITHDRAWN

MOTION NO.

NOTE: **In addition to these typed minutes, this Committee meeting was also taped by Bay 3 TV and those tapes are available for review in the Administrative Services Department or can be viewed on Bay County's website www.baycounty-mi.gov/executive/videos.**

1 **MOVED, SUPPORTED AND CARRIED TO APPROVE THE MINUTES OF THE JANUARY 3, 2012 WAYS AND MEANS COMMITTEE MEETING AS PRINTED.**

Public input was called. Art Schupack, Veterans Service Officer, thanked the Board for the additional funding which will allow him to be paid for services. He spoke to the number of people that are helped through his office and the services provided. His office hours at Monday thru Friday 7 a.m. to 12 p.m. Bruce Douglas, Veterans Council, thanked the Commissioners for the new van which has allowed them to assist 44 new veterans. The drivers are very grateful as are the veterans serviced. Fred Zipples, Treasurer of the Veterans Council, also voiced his thanks to the Board for all that has been done to assist veterans in Bay County.

2 **MOVED, SUPPORTED AND CARRIED TO RECOMMEND BOARD APPROVAL OF THE PROPOSED RESOLUTION RE APPLICATION FOR GRANT FUNDING FOR ADULT DRUG COURT DISCRETIONARY PROGRAMS (DISTRICT & CIRCUIT COURTS).**

3 **MOVED, SUPPORTED AND CARRIED TO RECOMMEND BOARD APPROVAL OF THE PROPOSED RESOLUTION RE CONTRACT FOR CHIEF SOLUTION AREA PLANNER POSITION WITH THE SAME LEVEL OF PAY, MONIES FROM HOMELAND SECURITY FUNDS (HOMELAND SECURITY).**

4 **MOVED, SUPPORTED AND CARRIED TO RECOMMEND BOARD APPROVAL OF THE PROPOSED RESOLUTION RE RESCISSION OF RES. NO 2004-08 - GOLF COURSE CAPITAL OUTLAY FUNDS TO ALLOW CASH FLOW FOR START UP OF THE 2012 GOLF COURSE OPERATIONS.**

5 **MOVED, SUPPORTED AND CARRIED TO RECOMMEND BOARD APPROVAL OF THE PROPOSED RESOLUTION RE GREAT LAKES GRANT APPLICATION(S) (ENVIRONMENTAL AFFAIRS).**

6 **MOVED, SUPPORTED AND CARRIED TO RECOMMEND BOARD APPROVAL OF THE PROPOSED RESOLUTION RE LIGHT TRAP CONTRACTS FOR 2012 (MOSQUITO CONTROL).**

7 **MOVED, SUPPORTED AND CARRIED TO RECOMMEND BOARD APPROVAL OF THE PROPOSED RESOLUTION RE BID AWARDS FOR CONTROL MATERIALS (MOSQUITO CONTROL).**

MOTION NO.

8 MOVED, SUPPORTED AND CARRIED TO RECOMMEND BOARD APPROVAL OF THE PROPOSED RESOLUTION RE PURCHASE OF TWO ONE-HALF TON TRUCKS (MOSQUITO CONTROL).

9 MOVED, SUPPORTED AND CARRIED TO RECOMMEND BOARD APPROVAL OF THE PROPOSED RESOLUTION RE BIDS AND CONTRACTS FOR TREATMENT OF EMERALD ASH BORER (GYPSY MOTH PROGRAM).

10 MOVED, SUPPORTED AND CARRIED TO RECOMMEND BOARD APPROVAL OF THE PROPOSED RESOLUTION RE CORRECTION TO ENVIRONMENTAL HEALTH FEES FOR 2012, I.E. SERV SAFE-NOT FOR PROFIT AND REINSPECTION FEE (HEALTH DEPT.).

11 MOVED, SUPPORTED AND CARRIED TO RECOMMEND BOARD APPROVAL OF PROPOSED RESOLUTION RE NATIONAL NETWORK OF PUBLIC HEALTH INSTITUTES FOR QUALITY IMPROVEMENT FUNDING (HEALTH DEPT.).

12 MOVED, SUPPORTED AND CARRIED TO RECOMMEND BOARD APPROVAL OF PROPOSED RESOLUTION RE SENIOR PROJECT FRESH COUPON GRANT FUNDING (DIVISION ON AGING/MSU).

13 MOVED, SUPPORTED AND CARRIED TO RECOMMEND BOARD APPROVAL OF PROPOSED RESOLUTION APPROPRIATING FUNDING FOR VETERANS SERVICE OFFICER (PERSONNEL).

14 MOVED, SUPPORTED AND CARRIED TO RECEIVE TUITION REIMBURSEMENT INFORMATION RE JILL MCKEON, FINANCE DEPARTMENT EMPLOYEE (PERSONNEL).

15 MOVED, SUPPORTED AND CARRIED TO RECOMMEND BOARD APPROVAL OF SUBMITTED BUDGET ADJUSTMENTS (FINANCE DEPT.).

16 MOVED, SUPPORTED AND CARRIED TO RECEIVE ANALYSIS OF GENERAL FUND UNRESERVED/UNDESIGNATED FUND BALANCE 2011 (FINANCE DEPT.).

17 MOVED, SUPPORTED AND CARRIED TO RECEIVE EXECUTIVE DIRECTIVE # 2007-11 (FINANCE DEPT.).

Under new business, Committee Chair Krygier advised of Bangor DDA funding available for new signs at the Civic Arena. He was seeking authorization for the Board Chair to sign the DDA Sign Contract. It was

MOTION NO.

18 MOVED, SUPPORTED AND CARRIED TO RECOMMEND BOARD APPROVAL OF THE CONTRACT WITH THE BANGOR DDA FOR SIGNS AT THE CIVIC ARENA.

Board Chair Coonan commented on the new Thin Clients in place for use during committee and board meetings. This worked out very well and he thanked administration and ISD for their efforts in making this happen. This Board has long supported the use of technology throughout the County.

Commissioner Krause advised of an upcoming fundraiser for medical expenses Todd Jezewski who was injured in a motorcycle accident in May. The fundraiser is scheduled for Sunday, April 15 at the Kawkawlin Township Hall. It is a spaghetti benefit dinner. Tickets are $8.

There being no further business, it was

19 MOVED, SUPPORTED AND CARRIED TO ADJOURN (4:35 P.M.).

Submitted by:

Deanne Berger

Deanne Berger
Board Coordinator

BAY COUNTY DEPARTMENT OF ENVIRONMENTAL AFFAIRS & COMMUNITY DEVELOPMENT

515 Center Avenue, Suite 501
Bay City, Michigan 48708

Phone (989) 895-4135
Fax (989) 895-4068
TDD (989) 895-4049
http://www.co.bay.mi.us/

LAURA OGAR, DIRECTOR
ogarl@baycounty.net

Community Development
Geographic Information Systems
Gypsy Moth Suppression Program
Mosquito Control
Transportation Planning

TOM HICKNER
County Executive

November 22, 2011

Mr. Darryl Poprave, AICP
Area Manager, Local Government and Community Affairs
ITC
2401 S. Huron Road
Kawkawlin, Michigan 48631

Re: Pinconning Park Improvements

Dear Mr. Poprave,

We welcome your interest in supporting the Bay County community to be a dynamic waterfront place to recreate and do business. We are especially pleased to learn you may have some community development support funding for worthy projects. The following is a proposal of needs in support of Pinconning Park. We hope you share our commitment to the unique natural setting of the park where visitors frequent to explore the Saginaw Bay.

Bay County Pinconning Park Improvements
Proposal

Background:
Bay County took over ownership and operation of the 206 acre Pinconning Park rustic campsite area from the state of Michigan in the late 1980's as it did not meet the state's larger campground standards. Since that time Bay County has invested over $1 million of improvements to include fifty (50) modern campsites, eight (8) rustic sites, two wildlife viewing towers, six (6) fully handicapped accessible log cabins, a bath house and dredged a 160 foot access channel to the bay to allow for a small boat launch site. Bay County is committed to the year round operations at Pinconning Park and ensuring this rare Great Lakes waterfront outdoor recreational area stays one of the best in Michigan.

Priority Needs:
The Saginaw Bay beach and beachfront day use area at Pinconning Park has long been the premier feature at the park drawing day use visitors as well as campers. It is only one of two locations on the nearly 35 mile shoreline of Bay County that residents and visitors can actually see the bay from their car as they drive into

the park. Our seasonal surveys done by the Park Ranger routinely confirm that the beach is the primary draw to the park for families with small children. The beach has not been adequately maintained due to lack of equipment, difficulty accessing to the water's edge with exposed bottomlands due to low water levels, and muck from invasive species including Phragmites, a tall invasive plant has taken hold in the Saginaw Bay shoreline areas. Greater access to the water for small water craft such as canoe's kayak's fishing boat skiffs etc is needed as both the campers, day use visitors, and fishermen compete for limited space on the boat launch area.

The following (prioritized) items are needed:

1.) **Beach Nourishment** - Sand for the beach is critically needed. Bay County has access to a beach sand groomer which we have borrowed and hauled to Pinconning Park for sifting rock, shells and other windblown debris from existing sand beach. However we have been unable to do this important maintenance as water levels have declined and more bottom lands are exposed. While the beach is a natural sand area, the invasion of shoreline Phragmites have adversely changed the quality of sand as a result of the deposition of decaying Phragmites plant material. (Note: A Phragmites Control Plan is currently being implemented with the first aerial treatment in October 2010. See below)

   Proposed Item: Clean sand in the amount of 900 yards is needed for beach nourishment purposes. Bay County will clean, groom and prepare the existing beach base prior to placement of the sand.
   Estimated cost: $6.50 per yard x 900 yards = $5,850

2.) Swimming Beach Amenities - A small changing booth is needed at the beachhead for changing into and out of bathing suits. Currently swimmers must use the outhouses at the far edge of the day use parking lot to change clothes. A small wooden benched enclosure will allow for privacy while changing and will minimize maintenance needs. A freshwater outdoor shower on a small concrete pad at the beachhead near the grass to rinse sand off before leaving the beach will encourage use of the swimming area.

   Proposed Changing Booth: Wooden changing booth with bench
   Estimated cost: $ 1,000.00
   Proposed freshwater rinse shower: Estimated $ 1,200.00

3.) Solar Light Channel Marker – Bay County places buoys out along the dredged channel to the Saginaw Bay to facilitate small boat access, however they can only be seen under clear bright flat water conditions. Waves easily block the sight of the buoys and they are difficult to see in darker light. A solar powered buoy light will assist navigators come into the Pinconning Park lagoon area to the boat launch.

   Proposed Solar Channel Light Estimated cost: $ 300.00

Future needs include support for ongoing implementation of the Phragmites Control Plan, trail maintenance equipment, and dredging of the small boat channel to allow for its continued use.

These are items the public has provided feedback on which they have identified as needs at the park. Surveys indicate use at the park would increase if these amenities were in place. We hope that ITC would consider support of these items, and we would be happy to place signage at the Park in a visible location indicating ITC as contributors towards the parks improvements.

We would be happy to meet with you and answer any questions you may have. Please feel free to call me at 989-895-4196, thank you.

Sincerely,

Laura Ogar

Laura Ogar, Bay County Director
Environmental Affairs and Community Development
515 Center Avenue, Suite 5
Bay City, Michigan 48708
989-895-4135 phone
989-895-4068 fax

cc: Tom Hickner, County Executive

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ENVIRONMENTAL AFFAIRS
& COMMUNITY DEVELOPMENT

515 Center Avenue, Suite 501
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Community Initiatives
Geographic Information Systems
Gypsy Moth Suppression Program
Mosquito Control
Transportation Planning

TOM HICKNER
County Executive

MEMORANDUM

DATE: February 29, 2012

TO: Commissioner Ernie Krygier, Chair
Ways & Means Committee

FROM: Laura Ogar, Director
Environmental Affairs & Community Development

RE: **Informational Agenda Items – Update on Saginaw Bay Work Plan Activities**

The Department of Environmental Affairs and Community Development is pleased to provide a status report of the following activities:

1.) Earth Day scheduling will include a full 2 weeks of activities coordinated in conjunction with the City of Bay City and USDA Natural Resources. The first event will be the Bay County sponsored e-waste (electronic waste) collection at the Bay County Fairgrounds on April 14th. This is a communitywide opportunity for residents to get rid of old electrical appliances' and outdated electronic items they have been holding on but not knowing what to do with such as microwaves, coffeemakers, printers, computers, cordless phones, VHS players, televisions, even old kitchen appliances, and drop them off where they will be collected and packaged for complete recycling. A list of acceptable items is on the Bay County Environment website at http://www.baycounty-mi.gov/EACD/Default.aspx. This event is free of charge and will run from 10am till 2pm Saturday April 14th at the Bay County Fairgrounds.

2.) Bay County has served as 'local host' for the regional Saginaw Bay Coastal Initiative (SBCI) since its inception in 2006. In that role, we facilitate the coordination of needs and action plans to address those shared environmental issues facing the Saginaw Bay and affecting the economic prosperity of Iosco, Arenac, Bay, Tuscola, and Huron counties and our neighbors. SBCI has developed an effective network of concerned citizens and local leaders who have raised the state and national awareness of Saginaw Bay and our coastal challenges. Active Work Groups show results in:

   a. Phragmites treatment 1st Phase Completed Fall 2011; with Bay County Buildings and Grounds efforts we will be cutting and burning of the treated Phragmites in the next several weeks in conjunction with local partners in Fraser and Kawkawlin townships. Huron County has also completed their 1st Phase of Phragmites control efforts along the Saginaw Bay shoreline as well.
   b. Nearshore/Septic Workgroup: Private foundation funding received to date is $94,000 and two (2) failing septic systems that would otherwise be still flowing into and contaminating the Kawkawlin River have been eliminated and replaced. The Bay County Health Department has inspected the installation to ensure compliance.
   c. Nearshore/Septic Workgroup with leadership by the Arenac Regional Health Department, Bay county, Tuscola and Huron County Health departments are finalizing a proposed Regional Septic Code based on national guidance that will coordinate the regional sanitary codes to allow for improved maintenance while allowing for the diverse conditions of the areas around the bay.
   d. SBCI Access with the Bay Area Chamber of Commerce Community Development Council are working on a developing a Saginaw Bay access site to re-develop a historical waterfront park and Pelr out onto and over the Saginaw Bay.

3.) The EA&CD Director applied for a NOAA Urban Waters grant to promote the substantial water quality treatment that has resulted in response to the investment the community has made to remedy Combined Sewer Overflows. A public education campaign is proposed to inform residents and business leaders on the improvements.

cc: Tom Hickner
Marty Fitzhugh
Deanne Berger

BAY COUNTY GYPSY MOTH SUPPRESSION PROGRAM
515 Center Avenue, Suite 503
Bay City, Michigan 48708

ALICIA WALLACE, COORDINATOR
wallacea@baycounty.net

Phone 989-895-4195
Fax 989-895-4068
TDD 989-895-4049
http://www.baycounty-mi.gov

LAURA OGAR, DIRECTOR
ogarl@baycounty.net

Community Initiatives
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TOM HICKNER
County Executive

MEMORANDUM

DATE: January 27, 2012

TO: Ernie Krygier, Chairman
Ways & Means Committee

FROM: Alicia Wallace, Gypsy Moth Program Coordinator

RE: **Request Placement of the Gypsy Moth Millage Renewal on the August 2012 Primary Ballot**

Please consider the following at the next meeting of the Ways and Means Committee scheduled for February 7, 2012:

Background:
The Bay County Gypsy Moth Suppression Program has helped protect the trees of Bay County since 1989. The millage has been approved for the past twenty-two years and has only been collected 7 times (twice in the last four years of authorization) due to grants and sound conservative practices that generated sufficient fund balance to operate the program. In 2011 this program began an initiative to help maintain ash trees on publicly held lands to reduce the environmental impacts of emerald ash borer (EAB) and mitigate the potential economic and safety risks associated with EAB damage. This program continually monitors the trees of Bay County to ensure that new and potentially damaging invasive pests are dealt with as soon as technology allows. There are no Grants available to assist this program at this time. However, future funding may become available due to the growing number of non-native invasive pests.

Economics/Finance:
The Gypsy Moth Program needs to renew millage funding to continue to provide Bay County residence with assistance in suppressing populations of gypsy moth, to continue the initiative to extend the life of ash trees on public lands and to address the problems caused by other non-native invasive species that will affect our trees. The 0.1 mill renewal for a period of four years will assure the continuation of this program.

Recommendation:
Request a favorable recommendation to the Board of Commissioners to place the 0.1 mil Gypsy Moth Millage question on the August primary ballot. The attached language has also been forwarded to Corporation Counsel for legal review.

Attachment: *Millage Renewal Language*

Gypsy Moth Program Millage
Financial considerations for posting Millage on Ballot 02-14-12

- The Gypsy Moth millage authorization expired last December 2011. Financially, the program will run out of money in 2013. We anticipate continuing treatment at the same levels we have leaving only $13,000 of the existing fund balance.

- In order for the Millage to be considered a "renewal", it will need to be placed on this coming ballot this summer August 2012. Any later than this and it will be considered a new added millage.

- After 2012, the next regular election will not occur until two years later in 2014 therefore the program would need to be shut down for a year until additional funds could be collected IF the voters once again approved the millage.

- The added financial burden to the city of Bay City alone could be extensive if we do not continue the EAB Treatment Project. At present they pay an average of $300 to $400 to remove a street tree. If all the trees that were treated in 2011 (2566 ash trees) were to die in a single year that would be a cost of almost $900,000.

- The "State" established deadline for "*Ballot wording ... to be presented at the August primary certified to the county clerk*" is May 29, 2012. However Ms. Luczak has advised me that the ballots are no longer prepared locally but by an outside vendor in Nebraska so will require additional lead time to assure the ballot is completed in a timely fashion. Therefore, I request that the Board of Commissioners consider this issue at the earliest possible meeting.

- The Gypsy Moth Program assists home owners throughout the County with questions and concerns about their trees, invasive pests and the health of their wooded areas. Education is a primary function of this program.

2008 Millage Language (As printed on Ballot August 5, 2008)

Gypsy Moth Millage Renewal

Shall the limitation of the amount of property taxes which may be assessed each year against all taxable real and personal property in Bay County be increased by not more than .1 of a mill (10¢ per $1,000.00) for a period of 4 years, 2008 to 2011 inclusive, to continue suppression, public education, and monitoring of Gypsy Moths and other invasive, non-native pests that damage local horticulture (trees and plants). This is a renewal of .1 of a mil approved by the voters in 2004 that expired in 2007. (this millage will raise estimated revenues of $292,825.00 in the first year of the levy).

2012 Millage Language (Proposed 01-20-12)

Gypsy Moth Millage Renewal

Shall the limitation of the amount of property taxes which may be assessed each year against all taxable real and personal property in Bay County be increased by not more than .1 of a mill (10¢ per $1,000.00) for a period of 4 years, 2012 to 2015 inclusive, to continue suppression, public education, and monitoring of Gypsy Moths, Emerald Ash Borer and other invasive, non-native pests that damage local horticulture (trees and plants). This is a renewal of .1 of a mil approved by the voters in 2008 that expired in 2011. (this millage will raise estimated revenues of $285,000.00 in the first year of the levy).

Present:
Dick Somalski, Paul Begick, Tom Putt, Agness Schmidt, Alicia Wallace, Pat Bilbrey, and Cyndi Gaul.

Excused: Jim Bedell, Bob Hubert, Laura Ogar and Sandy Webb.

Call to Order:
The meeting was called to order at 10:10 a.m. by Tom Putt.

Approval of the January 18, 2011 Meeting Minutes:
There being no additions, deletions, or corrections to the minutes of the **January 18, 2011** meeting minutes, a motion was made by Begick, seconded by Schmidt, to approve the minutes as printed. Motion Passed.

Public Comment:
There was no public comment brought before the committee.

Coordinator's Report

Fall Gypsy Moth Egg Mass Survey Results:
The Gypsy Moth Suppression Program Staff have completed the Fall Gypsy Moth Egg Mass Surveys and found that the population was significantly down. Staff found approximately 18 egg masses. Therefore, it is recommended that there be no spring spray treatment for the gypsy moth.

Emerald Ash Borer (EAB) Treatment Summary:
Alicia provided committee members with a handout outlining all the ash trees that were treated for EAB. There are 21 different entities that have ash trees on public lands. Last year staff were able to facilitate EAB treatment of 2,566 ash trees. There are still approximately 833 ash trees that qualify under the criteria that should be treated for EAB this spring.

Projected Emerald Ash Borer (EAB) Treatment Needs:
The 2,000 plus ash trees that were treated in 2011 will need to be re-treated in 2013. The exact number of ash trees treated in 2011 that will be re-treated in 2013 is unknown as some trees didn't take the EAB treatment or were struck by lightning or were taken down by property owners. Alicia said that in most cases you can really tell the treated trees from the non-treated trees so the EAB treatment is making a difference. To treat the 833 remaining ash trees in 2012 will cost approximately $100,000.00 (based on last years treatment costs).

Motion:
A motion was made by Dick Somalski, seconded by Agness Schmidt, to favorably recommend to the Ways and Means Committee that the Gypsy Moth Suppression Program treat the remaining 833 ash trees for EAB. Motion passed.

Financial Summary:
Alicia provided committee members with a financial summary table. According to the figures, the program has enough funds to treat trees for EAB at least one more time. The current millage expired in 2011. Currently, there are enough program funds to support the Gypsy Moth Suppression Program through 2013. Advisory Members were concerned as there are new, non-native invasive pests on the horizon like the Asian Long Horn Beetle that attacks maple trees. The group feels that this is a vital program to the health of the environment.

Advisory Business

2012 Election of Officers:
A Motion was made by Paul Begick, seconded by Agness Schmidt, to keep Sandy Webb as the Chair and Dick Somalski as the Vice-Chair of the Gypsy Moth Advisory Committee. Motion Passed.

2012 Gypsy Moth Advisory Committee Members:
As stated in Article II of the Gypsy Moth Advisory By-Laws, the County Executive appoints the members of the Advisory Committee for a term of one year. This request must be submitted and approved by the Bay County Executive each program year. If you haven't submitted your request, please do so immediately.

New Committee Members:
Alicia discussed the importance of getting some new members on the Gypsy Moth Advisory Committee. Jim Bedell/City of Bay City is planning on becoming a regular part of the committee. Alicia was looking for any ideas committee members might have to increase membership. Dick Somalski recommended that Alicia send something to each of the townships. It was also suggested that Alicia contact gardening clubs, master gardeners, tree groups, etc. to see if we can get some increased membership.

Millage Renewal:
The current millage expired in 2011. In order to keep the program funded, the millage renewal will need to be placed on the 2012 ballot in order to keep the millage a renewal. Alicia provided everyone with a handout of the millage language that was proposed on the 2008 ballot. The millage has been collected only seven (7) times over the last 22 years. Once the request to renew the millage has been approved by the Gypsy Moth Advisory Committee, it will have to go through Ways & Means and the Board of Commissioners. Alicia asked if there would be any changes required. After discussion, the group agreed that there should be an addition of Emerald Ash Borer (EAB) to the millage language.

Motion:
A motion was made by Paul Begick, seconded by Agness Schmidt, to favorably recommend to Mr Hickner and the Ways and Means Committee that the Gypsy Moth Suppression Program request a millage renewal for 2012, with the addition of the EAB to the millage language. Motion passed.

OTHER:

Accurate Information:
Paul Begick would like to see accurate information getting out to the public after incorrect

information was reported in the Bay City Times regarding the Veteran's getting funding from the Gypsy Moth Suppression Program. Alicia explained that she has talked to the Bay City Times and is working on having the correct information put out in the news paper. The Bay City Times E-News Paper had printed correct information.

Alicia will be doing an article for the Bay City Times, Pinconning Journal, and Great Lakes Bay Magazine regarding the proposed millage renewal. She will also be doing a program on Bay 3-TV promoting the millage renewal. Committee Members asked if there was any way to get information out on some sort of "social media". Alicia explained that the Bay County was on Facebook and that she would be able to post information about the millage through the Bay County Facebook account.

Tom Putt felt that it was very important that throughout all the messages, especially when Alicia is before the Board of Commissioners, that the fact that the Gypsy Moth Suppression Program has only collected the millage seven (7) times in 22 years. He felt that was a huge factor in our favor.

Re-Leaf Michigan:
This program is a 50/50 match that helps to replant trees. Alicia would like the Gypsy Moth Advisory Committee to support the use of her time in helping facilitate programs like Re-Leaf Michigan so that trees lost to the EAB can be re-planted in Bay County. Alicia would also like to explore other funding avenues for this same purpose. Discussion ensued.

Motion:
A motion was made by Agness Schmidt, seconded by Paul Begick, to favorably support Alicia Wallace's being a facilitator of tree replacement programs on public lands where trees have been lost due to EAB. This would be at a cost of only her time. Motion passed.

Re-Pine Bay County:
Alicia mentioned the idea of supporting a Re-Pine Bay County movement that would help bring back the White Pine to this area. This would be a way to re-forest Bay County. Discussion ensued.

Next Meeting:
The date for the next meeting was scheduled for ***Friday, April 20, 2012*** at 10:00 a.m. in the Finance Department's Conference Room located on the 7th floor of the Bay County Building, 515 Center Avenue, Bay City, Michigan.

As there was no further business, the January 20, 2012 Gypsy Moth Advisory Committee meeting was adjourned at 11:10 a.m.

Respectfully submitted,

Alicia Wallace
Gypsy Moth Program Coordinator

Transcribed by: Cyndi Gaul

Owner	Owner Code	TOTAL TREES	Tree Condition			Remove	Gone	Treated 2011	Treat in 2012
			Good	Fair	Poor				
Bangor Township	010	7	0	0	7	0	0	0	0
Beaver Township	020	0	0	0	0	0	0	0	0
Frankenlust Twp	030	19	9	5	0	5	0	7	2
Fraser Twp	040	4	3	1	0	0	0	0	4
Garfield TWP	050	17	10	1	0	6	0	0	11
Gibson Twp	060	13	8	0	0	5	0	0	8
Hampton Twp	070	96	73	4	3	14	2	57	22
Kawkawlin Twp	080	5	5	0	0	0	0	0	5
Merritt Twp	090	4	3	0	0	1	0	0	3
Monitor Twp	100	20	19	0	0	1	0	6	13
Mt Forest Twp	110	0	0	0	0	0	0	0	0
Pinnconning Twp	120	0	0	0	0	0	0	0	0
Portsmouuth Twp	130	25	18	2	0	1	4	9	12
Williams Twp	140	46	44	1	0	1	0	39	5
Auburn	150	33	32	0	0	1	0	11	21
Bay City	160	2634	2390	78	29	115	20	1928	567
Essexville	170	127	111	11	3	0	2	92	29
Pinconning	180	37	33	2	0	2	0	15	18
Bay County	190	495	410	26	20	17	22	339	101
Bangor Twp Schools	210	13	7	0	0	6	0	5	2
Bay City Public Schools	260	28	23	0	2	3	0	24	1
Essexville Schools	270	33	26	2	0	5	0	20	7
Pinconning Schools	280	7	4	2	0	1	0	4	2
ISD	290	20	0	0	0	0	20	10	0
Totals		**3683**	**3228**	**135**	**64**	**184**	**70**	**2566**	**833**

Bay County Gypsy Moth Suppression Program
Historical Financial Summary

Year	Acres Treated	Acres Monitored	Expenditures			Revenue				Prior/end Year Balance	% Grant Funded	Mills Levied for next year?
			Admin.	Spray	Total	Taxes	Grant	Interest	Total			
1989 to 1993	31,450 ac	10,000 to 68,000 per year	$366,356	$258,649	$625,005	$775,728	$277,943	$76,673	$1,130,344	$505,339	44.47%	Y'89 / '90 N '91-3 renewed
1994 to 1998	2,441 ac	68,000 ac per year	$326,737	$17,991	$344,728	$109	$146,884	$118,495	$265,488	$426,099	42.61%	N'94-98 renewed '94 / '96
1999 to 2003		68,000 ac per year	$335,358	$36,543	$371,901	$44	$79,472	$68,288	$147,804	$202,002	21.37%	N '99-'03 renewed 2000/'04
2004 to 2007	3369 ac	68,000 ac per year	$318,455	$38,168	$356,623	$262,962	$72,304`	$38,172	$373,438	$218,817	Grant 04 '05, '06 '07 none	Y '04 n '05,'06, '07
2008	450 ac	68,000 ac	$83,371	$10,628	$93,999	$296,233	$0	$15,466	$311,699	$436,517	No Grant	Y renewed '08
2009	95 ac	68,000 ac	$93,469	$5,235	$98,704	$303,055	$0	$17,703	$320,758	$658,571	No Grant	Y
2010	0	68,000 ac	$128,641	$0	$128,641	$305,111	$0	$15,768	$320,879	$850,809	No Grant	N
2011	2566 trees	85,000 ac	$93,129	$217,399	$310,528	$0	$0	$8,783	$8,783	$549,064	No Grant	N
2012*	833 trees	85,000 ac	$102,000	$125,000	$227,000	$0	$0	$10,000	$10,000	$332,064	No Grant	Y? renew?'12
2013*	2600 trees	85,000 ac	$102,000	$200,000	$302,000	$0	$0	$8,000	$8,000	$38,064	No Grant	no millage
2014*	0 trees/ ?ac for GM	85,000 ac	$102,000	$25,000	$127,000	$0	$0	$1,000	$1,000	($87,936)	No Grant	no millage
totals			$1,847,516	$709,613	$2,557,129	$1,943,242	$576,603	$359,348	$2,889,193		22.55%	

*projected
rev February 14, 2012
G:\Gypsy Moth Program\budget\fund balance summary 2012.wpd

CANVASS OF VOTES CAST
AT THE
PRIMARY ELECTION
HELD ON
TUESDAY, AUGUST 5, 2008
FOR THE
BAY COUNTY
GYPSY MOTH MILLAGE RENEWAL PROPOSAL

Bay County, Michigan and canvassed by the Board of Canvassers for Bay County, Michigan

Gypsy Moth Millage Renewal

Shall the limitation of the amount of property taxes which may be assessed each year against all taxable real and personal property in Bay County be increased by not more than .1 of a mill (10¢ per $1,000) for a period of 4 years, 2008 to 2011 inclusive, to continue suppression, public education, and monitoring of Gypsy Moths and other invasive, non-native pests that damage local horticulture (trees and plants). This is a renewal of .1 of a mill approved by the voters in 2004 that expired in 2007. (This millage will raise estimated revenues of $306,531 in the first year of the levy).

STATEMENT OF VOTES

The statement of votes polled in all voting precincts of Bay County at the Primary Election held on Tuesday, August 5, 2008 and filed with the County Clerk and this board having duly examined and considered said statement the whole number of votes given for and against the Bay County Gypsy Moth Millage Renewal Proposal was as follows:

Total number of votes cast:	Fifteen thousand, two hundred seventy two	(15,272)
Total "Yes" votes cast:	Eleven thousand, four hundred forty six	(11,446)
Total "No" votes cast:	Three thousand, eight hundred twenty six	(3,826)

The Bay County Gypsy Moth Millage Renewal Proposal was considered to have been passed.

County of Bay
State of Michigan

We do hereby certify that the foregoing is a correct statement of votes cast at the Primary Election held on Tuesday, August 5, 2008.

We further certify that the Board of Election Inspectors at said Primary Election, held on Tuesday, August 5, 2008, in its return to this board certified that:

1. All members of the Board of Election Inspectors were qualified electors of the district and each of them took the Constitutional Oath of Office before entering on the duties as a member of such board.

2. The polls of election were declared open at 7:00 a.m. and were kept open continuously until 8:00 p.m. on said Tuesday, August 5, 2008.

3. All electors of Bay County who were registered were permitted to vote at the Primary Election held on Tuesday, August 5, 2008.

IN WITNESS WHEREOF, WE HAVE HEREUNTO set our hands and caused to Be affixed the seal of the Circuit Court for the County of Bay this 8th day of August 2008.

Donald Chevalier BOARD
Donald Chevalier, Chairman

Walter Wozniak Jr. OF
Walter Wozniak Jr., Bd. Member

Matthew Lance COUNTY
Matthew Lance, Board Member

A TRUE COPY ATTEST: Janice Pierson CANVASSERS
Janice Pierson, Board Member

Cynthia A. Luczak
Cynthia A. Luczak, Clerk of the
County of Bay, State of Michigan

No. 2012-

BAY COUNTY BOARD OF COMMISSIONERS
3/13/13
RESOLUTION

BY: WAYS AND MEANS COMMITTEE (3/6/12)

RESOLVED That the following ballot question shall be submitted to the electors of this County on August 7, 2012, for the purpose of renewing the property tax limitation by .10 of a mill for the purpose of continued suppression, public education, and monitoring of Gypsy Moths and other invasive, non-native pests that damage local horticulture (trees and plans); And Be It Further

RESOLVED That the question to be submitted to said electors at said election shall be in the following form:

Bay County Gypsy Moth Suppression Program

Shall the limitation of amount of property taxes which may be assessed each year against all taxable real and personal property in the County of Bay be increased by not more than .1 of a mill (10¢ per $1,000) for a period of 4 years, 2012 to 2015 inclusive, to continue suppression, public education, and monitoring of Gypsy Moths, Emerald Ash Borer and other invasive, non-native pests that damage local horticulture (trees and plants). This is a renewal of the .1 of a mill approved by the voters in 2008 that expired in 2011. (This millage will raise estimated revenues of ($285,000) in the first year of levy).

And Be It Further

RESOLVED That changes as to form made by Corporation Counsel are permitted.

ERNIE KRYGIER, CHAIR
AND COMMITTEE

Gypsy Moth Suppression Program - 2012-2015

MOVED BY COMM._____

SUPPORTED BY COMM._____

COMMISSIONER	Y	N	E	COMMISSIONER	Y	N	E	COMMISSIONER	Y	N	E
Michael J. Duranczyk				Joe Davis				Tom Ryder			
Brandon Krause				Ernie Krygier				Christopher Rupp			
Vaughn J. Begick				Kim Coonan				Donald J. Tilley			

VOTE TOTALS:
ROLL CALL: YEAS_____ NAYS_____ EXCUSED_____
VOICE: YEAS_____ NAYS_____ EXCUSED_____

DISPOSITION: ADOPTED_____ DEFEATED_____ WITHDRAWN_____
AMENDED_____ CORRECTED____ REFERRED_____

BAY COUNTY DRAIN COMMISSIONER

JOSEPH RIVET
rivetj@baycounty.net

515 CENTER AVENUE, SUITE 601
BAY CITY, MICHIGAN 48708-5127
drainoffice@baycounty.net

PHONE (989) 895-4290
FAX (989) 895-4292
TDD (989) 895-4049
(HEARING IMPAIRED)

TO: Kim Coonan, Chair, Board of Commissioners

FROM: Joseph Rivet, Drain Commissioner

DATE: February 28, 2012

RE: Soil Erosion and Sedimentation Control Standards

As you are aware, Bay County is designated as a County Enforcing Agency for the State's Soil Erosion and Sedimentation Control Program. You have assigned that function to the Drain Office. The Office of the Bay County Drain Commissioner also has the designation as an Authorized Public Agency (APA), which allows us to work in County Drains without going through the usual construction permitting process.

Recently, MDEQ has approved an APA Procedures Manual for work in county drains developed by the Michigan Association of County Drain Commissioners. The lengthy manual outlines methods and practices to minimize erosion when we work in drains. We believe the manual represents an appropriate approach to addressing this issue and believe it makes sense for Bay County.

MDEQ has asked that the County formally adopt the manual so they have documentation on the approach our office will take to completing earth change work in our drains. I present it to you for consideration as a Board agenda item at your convenience. Given its length, I have attached a single copy for your review. Additional copies can be provided, as hard copy or electronically as necessary.

Thank you for your consideration.

C: D. Beger
T. Hickner
R. Redmond

No. 2012-

BAY COUNTY BOARD OF COMMISSIONERS

3/13/12

RESOLUTION

BY: WAYS AND MEANS COMMITTEE (3/6/12)

WHEREAS, Bay County is the designated enforcing agency for soil erosion and sedimentation control as outlined in Part 91 of the Michigan Natural Resources and Environmental Protection Act of 1994 (NREPA); and

WHEREAS, The Office of the Bay County Drain Commissioner has been granted Authorized Public Agency status for earth changes in County Drains by the Michigan Department of Environmental Quality (MDEQ); and

WHEREAS, The MDEQ has recently approved a procedures manual developed by the Michigan Association of County Drain Commissioners (MACDC) for soil erosion and sedimentation control in county drains; and

WHEREAS, The MDEQ has requested all authorized public agencies working in waters of the state to submit standard and practices for soil erosion and sedimentation control for approval; and

WHEREAS, The Bay County Drain Commissioner, after review of the manual, is recommending it be utilized as a standard for soil disruption in Bay County Drains; Therefore, Be It

RESOLVED That the Bay County Board of Commissioners hereby adopted the Soil Erosion and Sedimentation Control Authorized Public Agency Procedures Manual (on file and available for review in the Board of Commissioners' Office, the Drain Office and the County Clerk's Office) for use by the Bay County Drain Commissioner; Be It Further

RESOLVED That the MDEQ be notified of this approval to ensure compliance with the Part 91 of NREPA.

ERNIE KRYGIER, CHAIR
AND COMMITTEE

Drain Commissioner - Soil Erosion & Sedimentation Control - Procedures

MOVED BY COMM._____

SUPPORTED BY COMM._____

COMMISSIONER	Y	N	E	COMMISSIONER	Y	N	E	COMMISSIONER	Y	N	E
Michael J. Duranczyk				Joe Davis				Tom Ryder			
Brandon Krause				Ernie Krygier				Christopher Rupp			
Vaughn J. Begick				Kim Coonan				Donald J. Tilley			

VOTE TOTALS:
ROLL CALL: YEAS_____ NAYS_____ EXCUSED_____
VOICE: YEAS_____ NAYS_____ EXCUSED_____

DISPOSITION: ADOPTED_____ DEFEATED_____ WITHDRAWN_____
AMENDED_____ CORRECTED_____ REFERRED_____

BAY COUNTY
BUILDINGS & GROUNDS DIVISION

Richard C. Pabalis
Superintendent of Buildings & Grounds
pabalisr@baycounty.net

Thomas L. Hickner
County Executive

TO: ERNIE KRYGIER
CHAIRMAN OF WAYS & MEANS

FROM: RICHARD PABALIS
SUPERINTENDENT OF BUILDINGS & GROUNDS

DATE: FEBRUARY 22, 2012

RE: LEASE SPACE

REQUEST:
Approve Lease for approximately 820 square feet of office space to the State of Michigan located in the Court Facility for $657.00 per month.

BACKGROUND:
The Office of Criminal Defense/ Public Defender split their office space several years ago. Since that time the Office of Criminal Defense was eliminated and the space left empty. Circuit Court Probation occupies the office area directly east of the vacant offices and they have acquired permission from the State to lease that space for their Probation Agents. They plan on putting three Agents in that location, if approved by the Board.

ECONOMICS:
I called on a local Realtor and business owner to come up with the cost per foot. The office space has been sitting vacant for approximately one year. The County would see revenue coming in from the State each month under a contract with the State of Michigan.

RECOMMENDATION:
Approve Lease Agreement with the State of Michigan for $657.00 per month with Corporation Counsel to review and approve the Lease Agreement form.

Cc: Mike Gray
Crystal Hebert
Marty Fitzhugh
Tom Hickner

515 Center Avenue, Suite G101, Bay City, MI 48708-5121
(989) 895-4097 • FAX (989) 895-4222 • TDD (Hearing Impaired) (989) 895-4049
Web: www.baycounty-mi.gov

No. 2012-

BAY COUNTY BOARD OF COMMISSIONERS

3/13/12

RESOLUTION

BY: WAYS AND MEANS COMMITTEE (3/6/12)

WHEREAS, The Office of Criminal Defense/Public Defender split their offices space several years ago and since that time the Office of Criminal Defense was eliminated and the space left empty; and

WHEREAS, Circuit Court Probation occupies the office area directly east of the vacant office and they received permission from the State to lease that space for three (3) Probation Agents; and

WHEREAS, Based on input from a local realtor as to cost per foot, it has been determined that $657.00 per month is appropriate; and

WHEREAS, This rental would provide monthly rental from the State; Therefore, Be It

RESOLVED That the Bay County Board of Commissioners approves a Lease Agreement with the State of Michigan for lease of office space at the Court Facility at a monthly rental rate of $657; Be It Further

RESOLVED That the Chairman of the Board is authorized to execute said Lease Agreement with the State of Michigan on behalf of Bay County following legal review/approval; Be It Finally

RESOLVED That related budget adjustments, if required, are approved.

ERNIE KRYGIER, CHAIR
AND COMMITTEE

Bldgs & Grnds - Lease Agreement w/State - Court Facility

MOVED BY COMM._____

SUPPORTED BY COMM._____

COMMISSIONER	Y	N	E	COMMISSIONER	Y	N	E	COMMISSIONER	Y	N	E
Michael J. Duranczyk				Joe Davis				Tom Ryder			
Brandon Krause				Ernie Krygier				Christopher Rupp			
Vaughn J. Begick				Kim Coonan				Donald J. Tilley			

VOTE TOTALS:
ROLL CALL: YEAS_____ NAYS_____ EXCUSED_____
VOICE: YEAS_____ NAYS_____ EXCUSED_____

DISPOSITION: ADOPTED_____ DEFEATED_____ WITHDRAWN_____
AMENDED_____ CORRECTED_____ REFERRED_____

Bay County Fair and Youth Exposition
P.O. Box 633
Bay City, MI 48707
989-895-3744
*Email: fairbaycounty@yahoo.com *Website: www.baycountyfair.com*

February 7, 2012

Chairman Kim Coonan
Bay County Board of Commissioners
515 Center Avenue
Suite 405
Bay City MI 48708

RE: Bay County Fair & Youth Expo

Dear Chairman Kim Coonan,

I am representing the Bay County Fair & Youth Expo. I would like to summit the dates for our fair dated August 7th – 11th 2012. We are looking at a very eventful week at fair, along with a great future ahead for Bay County and Youth involved.

Showcasing the Youth of Bay County:

August 5th – Parade of Champion Horse Show
August 6th – Bump & Run (figure 8)
August 7th – Opening Ceremony, 4H Horse Show, Pocket Pullers (Lawn Tractors)
August 8th – 4H Livestock Show, Super Kicker Rodeo
August 9th – 4H Horse Show, Senior Citizens Ice Cream Social, 4H Animal Auction (nothing in grandstands)
August 10th –4H Archery Show, Truck Mud Bog
August 11th – Open Horse Show, Off Road Derby (Bump & Grind)

We are looking at several other events including: Children's Entertainment, Petting Zoo, Canteen building with crafts from 4H and Open, Youth Tent with several activities, Animal shows, dances in youth tent, Merchant Building with plenty of vendors to visit, and also with Family day on Tuesday with rides from Schmidt Amusements.

Sincerely

Bay County Fair & Youth Expo
President

No. 2012-

BAY COUNTY BOARD OF COMMISSIONERS

3/13/12

RESOLUTION

BY: WAYS AND MEANS COMMITTEE (3/6/12)

WHEREAS, The Bay County Fair Board is desirous of utilizing the Bay County Fairgrounds for the 2012 Bay County Fair scheduled for August 7 -11, Therefore, Be It

RESOLVED By the Bay County Board of Commissioners that the Bay County Fair Board is granted use of the Bay County Fairgrounds for the Bay County Fair for the period August 7 through August 11, 2012 including additional days for set-up and clean-up.

ERNIE KRYGIER, CHAIR
AND COMMITTEE

Fair Board - Fair Grounds for 2012 Fair

MOVED BY COMM._____

SUPPORTED BY COMM._____

COMMISSIONER	Y	N	E	COMMISSIONER	Y	N	E	COMMISSIONER	Y	N	E
Michael J. Duranczyk				Joe Davis				Tom Ryder			
Brandon Krause				Ernie Krygier				Christopher Rupp			
Vaughn J. Begick				Kim Coonan				Donald J. Tilley			

VOTE TOTALS:
ROLL CALL: YEAS_____ NAYS_____ EXCUSED_____
VOICE: YEAS_____ NAYS_____ EXCUSED_____

DISPOSITION: ADOPTED_____ DEFEATED_____ WITHDRAWN_____
AMENDED_____ CORRECTED____ REFERRED_____

Thomas L. Hickner
Bay County Executive

BAY COUNTY
Health Department
Creating A Healthy Environment For The Community

Barbara MacGregor, RN, BSN
Health Director

1200 Washington Avenue
Bay City, Michigan 48708
(989) 895-4003
FAX (989) 895-4014
TDD (989) 895-4049

To: Ernie Krygier, Chairman, Ways and Means Committee

From: Tracy Metcalfe, Community Health Educator/Analyst

Date: February 29, 2012

RE: Approval to Apply to the Bay County Community Foundation for Grant Funding to Support Community Health Improvement Planning (CHIP).

BACKGROUND:

Currently, the Bay County Health Department is undertaking a comprehensive Community Health Assessment (CHA) in collaboration with McLaren Bay Region, the Bay Health Plan and Bay Arenac Behavioral Health Association. It is anticipated the Community Health Assessment will be completed by late April, 2012. The next phase of the project will be the development of a Community Health Improvement Plan (CHIP) to address those health issues identified by the CHA. The Health Department is seeking grant funds to cover costs associated with development of the CHIP.

FINANCE AND ECONOMICS:

There are no financial considerations, as all costs associated with this project are included in this grant application, as well as by financial and in-kind resources committed by McLaren Bay Region and the Bay Health Plan.

RECOMMENDATION:

The Health Department recommends approval to apply for this grant. Upon favorable review by Corporation Counsel, any agreements relating to this grant are signed by the Board Chair and Board approval of any budget adjustments related to this grant.

CC: Barbara MacGregor, Health Director
Thomas Hickner, County Executive
Martha Fitzhugh, Corporation Counsel
Michael Gray, Administrative Services
Crystal Hebert, Finance
Tim Quinn, Personnel and Employee Relations

No. 2012-

BAY COUNTY BOARD OF COMMISSIONERS

3/13/12

RESOLUTION

BY: WAYS AND MEANS COMMITTEE (3/6/12)

WHEREAS, Currently the Bay County Health Department is undertaking a comprehensive Community Health Assessment (CHA) in collaboration with McLaren Bay Region, the Bay Health Plan and Bay Arenac Behavioral Health Authority; and

WHEREAS, It is anticipated the Community Health Assessment will be completed by late April 2012; and

WHEREAS, The next phase of the project will be the development of a Community Health Improvement Plan (CHIP) to address those health issues identified by the CHA; and

WHEREAS, The Health Department is seeking grant funds to cover costs associated with development of the CHIP; and

WHEREAS, There are no financial considerations as all costs associated with this project are included in this grant application as well as by financial and in-kind resources committed by McLaren Bay Region and the Bay Health Plan; Therefore, Be It

RESOLVED That the Bay County Board of Commissioners authorizes application for the Bay County Community Foundation grant to support Community Health Improvement Planning (CHIP); Be It Further

RESOLVED That the Chairman of the Board is authorized to execute the grant documents (application, grant award, all related required documents) on behalf of Bay County following legal review/approval; Be It Further

RESOLVED That the grant applicant/recipient departments are required to work with the Finance Department whose staff will provide financial oversight of said grant; Be It Finally

RESOLVED That related budget adjustments, if required, are approved.

ERNIE KRYGIER, CHAIR
AND COMMITTEE

Health Dept - CHIP Grant

MOVED BY COMM._____

SUPPORTED BY COMM._____

COMMISSIONER	Y	N	E	COMMISSIONER	Y	N	E	COMMISSIONER	Y	N	E
Michael J. Duranczyk				Joe Davis				Tom Ryder			
Brandon Krause				Ernie Krygier				Christopher Rupp			
Vaughn J. Begick				Kim Coonan				Donald J. Tilley			

VOTE TOTALS:
ROLL CALL: YEAS_____ NAYS_____ EXCUSED_____
VOICE: YEAS_____ NAYS_____ EXCUSED_____

DISPOSITION: ADOPTED_____ DEFEATED_____ WITHDRAWN_____
AMENDED_____ CORRECTED_____ REFERRED_____

Thomas L. Hickner
Bay County Executive

BAY COUNTY
Health Department
Creating A Healthy Environment For The Community

Barbara MacGregor, RN, BSN
Health Director

Joel R. Strasz
Public Health Services Manager

1200 Washington Avenue
Bay City, Michigan 48708
(989) 895-4006
FAX (989) 895-4014
TDD (989) 895-4049

To: Ernie Krygier, Chairman
Ways and Means Committee

From: Joel R. Strasz
Public Health Services Manager

Date: February 29, 2012

RE: Request Permission to Apply for Household Hazardous Waste Collection Grant from the Dow Chemical Company

BACKGROUND:
The Environmental Health Division of the Bay County Health Department has operated Household Hazardous Waste Collections on a bi-annual basis for the past seventeen years. These collections have been typically funded by support from the Dow Chemical Company.

FINANCE AND ECONOMICS:
There is no financial cost to the Health Department, as all costs associated with the collection and disposal will be included in the grant, if funded.

RECOMMENDATION:
Upon favorable review by Corporation Counsel, the Health Department recommends approval to seek funding from the Dow Chemical Company for this purpose, as well as approval of any and all agreements and budget adjustments related to this grant.

CC: Barbara MacGregor, Health Director
Thomas Hickner, County Executive
Michael Gray, Administrative Services
Marty Fitzhugh, Corporation Counsel
Tim Quinn, Personnel and Employee Relations
Crystal Hebert, Finance

No. 2012-

BAY COUNTY BOARD OF COMMISSIONERS

3/06/12

RESOLUTION

BY: WAYS AND MEANS COMMITTEE (3/6/12)

WHEREAS, The Environmental Health Division the Bay County Health Department has operated Household Hazardous Waste Collections on a bi-annual basis for the past seventeen years and these collections have been typically funded by support from the Dow Chemical Company; and

WHEREAS, The Health Department again wishes to make application for funding for this program for collection(s) for FY 2012 in Bay County; and

WHEREAS, There is no financial cost to the Health Department as all costs associated for the collection and disposal will be included in the grant, if funded; Therefore, Be It

RESOLVED That the Bay County Board of Commissioners authorizes the Bay County Health Department to seek funding from the Dow Chemical Company for Household Hazardous Waste Collections; Be It Further

RESOLVED That the Chairman of the Board is authorized to execute the grant documents (application, grant award, all related required documents) on behalf of Bay County following legal review/approval; Be It Further

RESOLVED That the grant applicant/recipient departments are required to work with the Finance Department whose staff will provide financial oversight of said grant; Be It Finally

RESOLVED That related budget adjustments, if required, are approved.

ERNIE KRYGIER, CHAIR
AND COMMITTEE

Health Dept - HHWC 2012

MOVED BY COMM._____

SUPPORTED BY COMM._____

COMMISSIONER	Y	N	E	COMMISSIONER	Y	N	E	COMMISSIONER	Y	N	E
Michael J. Duranczyk				Joe Davis				Tom Ryder			
Brandon Krause				Ernie Krygier				Christopher Rupp			
Vaughn J. Begick				Kim Coonan				Donald J. Tilley			

VOTE TOTALS:
ROLL CALL: YEAS_____ NAYS_____ EXCUSED_____
VOICE: YEAS_____ NAYS_____ EXCUSED_____

DISPOSITION: ADOPTED_____ DEFEATED_____ WITHDRAWN_____
AMENDED_____ CORRECTED____ REFERRED_____

Thomas L. Hickner
Bay County Executive

BAY COUNTY
Health Department
Creating A Healthy Environment For The Community

Barbara MacGregor, RN, BSN
Health Director

Joel R. Strasz
Public Health Services Manager

1200 Washington Avenue
Bay City, Michigan 48708
(989) 895-4006
FAX (989) 895-4014
TDD (989) 895-4049

To: Ernie Krygier, Chairman
Ways and Means Committee

From: Joel R. Strasz
Public Health Services Manager

Date: February 27, 2012

RE: Bio-Monitoring Agreement Between the Michigan Department of Community Health (MDCH) and the Bay County Health Department (BCHD)

BACKGROUND:
The Michigan Department of Community Health (MDCH) has received federal funding to evaluate body burden levels of persistent bio-accumulative toxic substances in subpopulations of Michigan residents most at risk of exposure to contaminants in sport-caught fish. In order to accomplish the objectives of this grant project, namely to measure specific toxins among local anglers who consume this game on a regular basis, MDCH wishes to enter into an agreement with the Health Department to provide clinical space and services to collect blood samples from individuals in the targeted populations.

FINANCE AND ECONOMICS:
There is no cost to enter into the proposed agreement. MDCH will reimburse the BCHD $40 per participant.

RECOMMENDATION:
Upon favorable review by Corporation Counsel, the Health Department recommends that the Bio-Monitoring Agreement be approved and signed by the Board Chair, and seeks Board approval for any necessary budget adjustments relating to this Agreement .

CC: Barbara MacGregor, Health Director
Thomas Hickner, County Executive
Michael Gray, Administrative Services
Marty Fitzhugh, Corporation Counsel
Tim Quinn, Personnel and Employee Relations
Crystal Hebert, Finance

No. 2012-

BAY COUNTY BOARD OF COMMISSIONERS

3/13/12

RESOLUTION

BY: WAYS AND MEANS COMMITTEE (3/6/12)

WHEREAS, The Michigan Department of Community Health (MDCH) has received federal funding to evaluate body burden levels of persistent bio-accumulative toxic substances in sub-populations of Michigan residents most at risk of exposure to contaminants in sport-caught fish; and

WHEREAS, In order to accomplish the objectives of the grant project, namely to measure specific toxins among local anglers who consume this game on a regular basis, MDCH wishes to enter into an agreement with the Health Department to provide clinical space and services to collect blood samples from individuals in the targeted population; and

WHEREAS, There is no cost associated with this agreement and MDCH will reimburse the BAHD $40 per participant; Therefore, Be It

RESOLVED That the Bay County Board of Commissioners approves the Bio-Monitoring Agreement between the Michigan Department of Community Health and Bay County (Health Department) and authorizes the Chairman of the Board to execute said Agreement on behalf of Bay County following legal review/ approval; Be It Finally

RESOLVED That related budget adjustments, if required, are approved.

ERNIE KRYGIER, CHAIR
AND COMMITTEE

Health Dept - Bio Monitoring Agt

MOVED BY COMM._____

SUPPORTED BY COMM._____

COMMISSIONER	Y	N	E	COMMISSIONER	Y	N	E	COMMISSIONER	Y	N	E
Michael J. Duranczyk				Joe Davis				Tom Ryder			
Brandon Krause				Ernie Krygier				Christopher Rupp			
Vaughn J. Begick				Kim Coonan				Donald J. Tilley			

VOTE TOTALS:
ROLL CALL: YEAS_____ NAYS_____ EXCUSED_____
VOICE: YEAS_____ NAYS_____ EXCUSED_____

DISPOSITION: ADOPTED_____ DEFEATED_____ WITHDRAWN_____
AMENDED_____ CORRECTED____ REFERRED_____

BAY COUNTY MOSQUITO CONTROL
810 Livingston
Bay City, Michigan 48708

TOM PUTT, MANAGER
puttt@baycounty.net

Phone (989) 894-4555
Fax (989) 894-0526
TDD (989) 895-4049
http://www.baycounty-mi.gov

LAURA OGAR, DIRECTOR
ogarl@baycounty.net

Community Initiatives
Geographic Information Systems
Gypsy Moth Suppression Program
Mosquito Control
Transportation Planning

TOM HICKNER
County Executive

To: Commissioner Ernie Krygier, Chairman
Ways and Means Committee

From: Thomas J. Putt, Manager
Bay County Mosquito Control

Date: February 29, 2012

Re: Placement on Ways and Means Committee Agenda

BACKGROUND:

Our aerial treatment program is the most important larvaciding activity conducted annually with the single highest control cost. Last year we successfully treated 48,000 acres of seasonally flooded woodlots. The Aerial treatment program was bid out in 2009. Clarke Environmental Mosquito Management is the current provider of the helicopter portion of the treatment program (approx. 7,000 acres). This company has provided excellent service during past years. Clarke has indicated that they would extend the current contract with all the terms and conditions for this year.

FINANCE:

The total cost of the aerial treatment services will not exceed the 2012 budget line item 802.00 (contractual services). The rate would be $5.90 an acre.

RECOMMENDATION:

I would recommend extending the contract with Clarke Environmental Mosquito Management for this year. This would stabilize the cost of a very important part of our treatment program and help with our budget concerns for the year. Thank you for your consideration.

cc: Tom Hickner
Mike Gray
Laura Ogar
Crystal Hebert
Marty Fitzhugh

No. 2012-

BAY COUNTY BOARD OF COMMISSIONERS

3/13/12

RESOLUTION

BY: WAYS AND MEANS COMMITTEE (3/6/12)

WHEREAS, The Mosquito Control aerial treatment program is the most important larvaciding activity conducted annually with the single highest control cost and in 2011, 48,000 acres of seasonally flooded woodlots were treated; and

WHEREAS, The aerial treatment program was bid out in 2009 and Clarke Environmental Mosquito Management is the current provider of the helicopter portion of the treatment program (approx. 7,000 acres); and

WHEREAS, The Bay County Mosquito Control Department has been very happy with the excellent service during the past years provided by Clarke; and

WHEREAS, Clarke has indicated that they would extend the current contract with all the terms and conditions for the 2012 program, i.e. $5.90/acre; and

WHEREAS, Funds are included in the 2012 Mosquito Control Program budget to cover this treatment program; Therefore, Be It

RESOLVED That the Bay County Board of Commissioners approves extension of the contract with Clarke Environmental Mosquito Management for 2012; Be It Further

RESOLVED That the Chairman of the Board is authorized to execute documentation that may be required for the contract extension on behalf of Bay County following legal review/approval; Be It Finally

RESOLVED That related budget adjustments, if required, are approved.

ERNIE KRYGIER, CHAIR
AND COMMITTEE

Mosquito Control - Clarke Aerial Treatment Contract Extension

MOVED BY COMM._____

SUPPORTED BY COMM._____

COMMISSIONER	Y	N	E	COMMISSIONER	Y	N	E	COMMISSIONER	Y	N	E
Michael J. Duranczyk				Joe Davis				Tom Ryder			
Brandon Krause				Ernie Krygier				Christopher Rupp			
Vaughn J. Begick				Kim Coonan				Donald J. Tilley			

VOTE TOTALS:
ROLL CALL: YEAS_____ NAYS_____ EXCUSED_____
VOICE: YEAS_____ NAYS_____ EXCUSED_____

DISPOSITION: ADOPTED_____ DEFEATED_____ WITHDRAWN_____
AMENDED_____ CORRECTED_____ REFERRED_____

BAY COUNTY
PERSONNEL DEPARTMENT

Tim Quinn, Director
quinnt@baycounty.net
(989) 895-4098 (T)
(989) 895-2076 (F)

Thomas L. Hickner
County Executive

Tiffany Jerry, Payroll/Benefits Super.
jerryt@baycounty.net
(989) 895-4032 (T)
(989) 895-4039 (F)

Danean Wright, Retirement Adm./Acct.
wrightd@baycounty.net
(989) 895-4043 (T)
(989) 895-4113 (F)

Penny Weller, Payroll Clerk
wellerm@baycounty.net
(989) 895-4044 (T)
(989) 895-4039 (F)

To: Ernie Krygier, Chair, Ways and Means
Kim Coonan, Chair, Bay County Board of Commissioners

From: Tim Quinn, Personnel Director

Re: **Health care initiative**

Date: February 29, 2012

On site clinics

As many of you are aware, we have been working over the last two years to find ways to decrease the costs of providing good, affordable health care to our employees. I wanted to outline some preliminary discussions that have been ongoing regarding a health care initiative concerning the possibility of opening a clinic in Bay City that would be accessible to five governmental entities:

City of Bay City	303 eligible employees
Bay County Medical Care Facility	190 eligible employees
Bay Arenac Behavioral Health	221 eligible employees
Bay County	342 eligible employees
Bay Arenac ISD	156 eligible employees

Note: 1,212 total employees (excludes retirees and those not currently covered).

Some of you have attended one of the previous meetings regarding this and Barb MacGregor has also attended a session.

This began when I contacted Angela Garner, from Brown and Brown (formerly PEBS), our third party administrator and asked her to explore the possibilities of a clinic. When I was at GM, assigned as a Labor Relations Administrator, a group of us visited the American Cast Iron Pipe Company (ACIPCO http://www2.american-usa.com), an employee-owned company in Birmingham Alabama, with about 3,000 employees . ACIPCO is always rated in the top 100 companies to work for (surprising, because it is a foundry) and had an on-site wellness clinic and hospital, in addition to traditional insurance.

Angela Garner found a company, CareATC, which has several clinics in the United States, although to date, none in Michigan. In order to make this viable for them and affordable to us, they would need 800 or more participants.

I have attached CareATC's publication. In short: Here are some of the provisions:

- Five days a week – total of 32 hours (8 hours M-W, 4 hours Th and F)
- 15 minute scheduled appointments
- No charge to our Blue Cross or EHIM Rx contract
- Same doctor all the time, no rotation
- Two administrative staff
- 1,200 square foot -- $80 -100K startup costs, shared pro-rata among participants
- Proven track record of impacting BCBS rates (with year 4 net savings of about $1,300 per employee/per year
- All visits and Rx are free to employees and their covered dependents
- Cost of about $54 per covered employee per month, about $218K annually, not counting start up

The savings to the County come from (1) removing barriers (doctor visit and Rx costs) so that employees and their dependents will establish a culture of getting medical attention and encouraging screening, early diagnoses of "preventable or treatable chronic" diseases such as breast cancer, prostate cancer, heart disease, diabetes. Any of these diseases could be disastrous to the patient and a major liability to our self-funded insurance plan. High risk individuals would receive additional attention.

The pluses for employees are (1) the savings that come from free doctor's visits and prescriptions; (2) if they have an undetected chronic disease, it will probably be more easily treatable in the early stages and (3) if this does slow the rate of medical inflation, their co-pays will be less than they otherwise be; (4) under the current labor agreements, the incentive payout for reduction of costs through EHIM would be enhanced because more people are using clinic Rx's.

In terms of big cost movers, the Blue Cross Blue Shield hospital and treatment costs and prescription drugs are the major variables, by a large margin. However, there are two other areas we should explore: (1) stepping up wellness activities such as encouraging employee exercise and diet through incentives and (2) de-incentivizing failures to comply with those items.

Past Efforts to date to reduce health care costs (2010-11)

Medtipster: An on-line program which encourages people to use generic drugs by showing sights where free generics are available.

Ulliance: Employee Assistance Program (EAP) - Found a company which provides more and better in-house counseling which reduces the number of people going to outside doctors.
UNUM: Will replace Ulliance in mid-2012 as the EAP provider because the service is free (compared to $40k+ for Ulliance) as a benefit attached to insurance we already receive from them.

Labor Agreement Changes to Health Care RX coverage: Two-tiered medical for new hires or those who want to opt to a lower cost plan and a new prescription drug carrier, EHIM which has more efficient purchasing power than Blue Cross. Although it is too early to say definitively, PEBS had projected a 15% increase in prescription drug costs in 2012 or 2011. January 2011 costs were approximately $124 K. January 2012 was $104K, a swing of almost 30% from projections.

Economics:

If enacted with the other four entities, this would require approximately $30,000 startup costs and about $218,000 a year to operate. Funds to come from the Health Care Fund.

Recommendation:

If this is an initiative we want to pursue, we should go out for bids. Although Bay County has led this initiative, the other four governmental entities appear ready to go forward with going out for bid. Although it was originally believed that this could be up and running by summer of 2012, a couple of factors are slowing this process down a bit: (1) McLaren has indicated a desire to compete if we go out for bids and (2) BABH cannot start until 1/1/2013, because they are going self-insured at that time and it would be a large penalty to go before then. At this time, it appears that the other four entities are very willing to go.

Administration's recommendation is that this be moved to the Board of Commissioners to approve going out for bids with the other four entities for an on-site clinic.

Encl.
cc: Tom Hickner
Mike Gray
Marty Fitzhugh
Barb MacGregor
Angela Garner
Tiffany Jerry

No. 2012-

BAY COUNTY BOARD OF COMMISSIONERS

3/13/12

RESOLUTION

BY: WAYS AND MEANS COMMITTEE (3/6/12)

WHEREAS, Bay County has been involved in efforts to find ways to decrease the costs of providing good, affordable health care to its employees; and

WHEREAS, Preliminary discussions have been ongoing regarding a health care initiative and the possibility of opening a clinic in Bay County that would be accessible to five governmental entities, i.e. City of Bay City, Bay County Medical Care Facility, Bay Arenac Behavioral Health, Bay County and Bay County ISD (1,212 total employees); and

WHEREAS, It is anticipated that pursuing this initiative will be beneficial financially to the employer and employee and in provided services to the employee; and

WHEREAS, Although Bay County has led this initiative, the other four governmental entities appear ready to go forward through a bidding process; Therefore, Be It

RESOLVED That the Bay County Board of Commissioners authorizes pursuing bids along with the other governmental entities, i.e. City of Bay City, Bay County Medical Care Facility, Bay Arenac Behavioral Health and Bay County ISD for an on-site wellness clinic.

ERNIE KRYGIER, CHAIR
AND COMMITTEE

Personnel - Health Care Initiative - On-Site Wellness Clinic

MOVED BY COMM._____

SUPPORTED BY COMM._____

COMMISSIONER	Y	N	E	COMMISSIONER	Y	N	E	COMMISSIONER	Y	N	E
Michael J. Duranczyk				Joe Davis				Tom Ryder			
Brandon Krause				Ernie Krygier				Christopher Rupp			
Vaughn J. Begick				Kim Coonan				Donald J. Tilley			

VOTE TOTALS:
ROLL CALL: YEAS_____ NAYS_____ EXCUSED_____
VOICE: YEAS_____ NAYS_____ EXCUSED_____

DISPOSITION: ADOPTED_____ DEFEATED_____ WITHDRAWN_____
AMENDED_____ CORRECTED____ REFERRED_____

RESOLUTION NO. _____

BY: WAYS AND MEANS COMMITTEE 03/06/2012

RESOLVED: By this Board of Commissioners of Bay County, Michigan, that the following Budget Adjustments are hereby approved on **03/13/2012** and, if required, the Chairman of the Board is hereby authorized to execute any documentation necessary for said Budget Adjustments on behalf of Bay County:

Journal Request Number	Fund Involved Department Involved	Favorable Impact	Unfavorable Impact	No Impact
2012-03-003	**DIVISION ON AGING FUND**			
	HEALTH PROMOTION			
	Total DIVISION ON AGING FUND			X
	TO INCREASE BUDGET FOR HEALTH PROMOTION ADDITIONAL FEES COLLECTED.			
2012-03-004	**HEALTH DEPT - DIST HEALTH FUND**			
	HEALTH DEPART.- ADMINISTRATION			
	FAMILY PLANNING			
	Total HEALTH DEPT - DIST HEALTH FUND		$12,272	
	BUDGET FOR THREE MORE MONTHS FOR THE FAMILY PLANNING TYPIST CLERK (MAY 2012 THRU JULY 2012) WHICH WILL THEN QUALIFY THAT INDIVIDUAL FOR FULL RETIREMENT BENEFITS.			

Ernie Krygier, Chairman W. & M. and Committee

_____

-40-

Budget Adjustment Detail

Journal Request Number **2012-03-003**

Ref: INCREA Desc: INCREASED Eff Date: 03/13/2012

Org / Object		Description	I/D	Amount
DIVISION ON AGING FUND HEALTH PROMOTION				
27667202	62500	MISC. SERVICES / FEES	I	720
27667202	79900	OTHER SUPPLIES	I	500
27667202	80200	CONTRACTUAL SERVICES	I	220

	Favorable	Unfavorable
Total DIVISION ON AGING FUND	$0	$0

Explanation

TO INCREASE BUDGET FOR HEALTH PROMOTION ADDITIONAL FEES COLLECTED.

Budget Adjustment Detail

Journal Request Number **2012-03-004**

Ref: HEALTH Desc: HEALTH Eff Date: 03/13/2012

Org / Object		Description	I/D	Amount
HEALTH DEPT - DIST HEALTH FUND				
HEALTH DEPART.- ADMINISTRATION				
22160100	40001	FUND BALANCE	I	12,272
FAMILY PLANNING				
22161600	71900	OTHER FRINGE BENEFITS (DETAIL)	I	12,272

	Favorable	Unfavorable
Total HEALTH DEPT - DIST HEALTH FUND	$0	$12,272

Explanation

BUDGET FOR THREE MORE MONTHS FOR THE FAMILY PLANNING TYPIST CLERK (MAY 2012 THRU JULY 2012) WHICH WILL THEN QUALIFY THAT INDIVIDUAL FOR FULL RETIREMENT BENEFITS.

-42-

Analysis of General Fund Unreserved/Undesignated Fund Balance 2012

Description	Res. or Motion #	2012 Fund Balance
Estimated Unreserved/Undesignated Fund Balance or (Deficit) 12/31/2011		$3,500,000
Reverse previous years reserved/designated Fund Balance *		$0
Unreserved/Undesignated Fund Balance or (Deficit)		$3,500,000
2012 Budgeted Surplus / (Deficit)		$111,945
BUDGET ADJUSTMENTS POSTED IN JANUARY THROUGH FEBRUARY 2012		
To budget for rollover of 2011 PO's @12/31/11*		$0
Budget for licensing costs for additional users for employee self serve	12-02-0002	($5,560)
Budget for $1,000 Insurance deductible for marine patrol boat repair	12-02-0004	($1,000)
Corr. MSU budget contractual expense s/b $9,043 less offset coord wages	12-02-0005	$4,155
To budget for seasonal help at $8.00 an hour for Pinconning Park grant	12-02-0006	(2,811)
February 29, 2012		(5,216)
Estimated Unreserved, Undesignated Fund Balance or (Deficit) 2/29/2012		$3,606,729

ADDENDUM
TO THE
WAYS AND MEANS COMMITTEE AGENDA
TUESDAY, MARCH 6, 2012
4:00 P.M.
FOURTH FLOOR, BAY COUNTY BUILDING

1- 2 A. ADDITION TO AGENDA

1. Probate Judge - Safe Havens: Supervised Visitation and Safe Exchange Grant **(Seeking authorization to make application for grant funding and to act as fiduciary for the grant funds; authorization for Board Chair to sign required documents; approval of required budget adjustments - proposed resolution attached)**

March 2, 2012

Ernie Krygier, Chairman
Ways and Means Committee
Bay County Board of Commissioners

RE: **SAFE HAVENS: SUPERVISED VISITATION AND SAFE EXCHANGE GRANT**

The Circuit Court Family Division is seeking Board approval to apply for the above entitled grant from the US Department of Justice. The application deadline is March 26, 2012. The grant requires that the applicant be a unit of local government (not a court.)

The amount of the grant varies from $300,000 to $400,000 for a 3 year period and there is no cash match required from the governmental applicant.

The Friend of the Court, District Court, and Probate all deal with dysfunctional families where children and parents have been exposed to domestic violence. We do our best to provide supervised parenting time to these families, but we do not have the resources to provide adequate supervision, especially during important family times on weekends and evenings.

The Bay County Women's Center is staffed 24 hours a day and has the resources to provide a supervised setting. The courts approached them with the request to investigate funding for a "safe haven" to exchange children from one parent to another (currently done at police department) and to provide a safe place for volatile parents or victims to visit with their children.

Since the deadline is later this month, we are asking permission today to make application in the name of Bay County. The county would be the fiduciary and pass-through the funds to the Women's Center if the grant is awarded.

Thank you for your consideration.

Karen A. Tighe
Judge of Probate & Family Court

-/-

No. 2012-

BAY COUNTY BOARD OF COMMISSIONERS

3/13/12

RESOLUTION

BY: WAYS AND MEANS COMMITTEE (3/6/12)

WHEREAS, The Circuit Court Family Division is seeking approval to apply for a Safe Havens: Supervised Visitation and Safe Exchange Grant from the US Department of Justice; and

WHEREAS, The grant deadline is March 26, 2012 and requires that the applicant be a unit of local government not a court; and

WHEREAS, The amount of the grant varies from $300,000 to $400,000 for a 3 year period and there is no cash match required from the governmental applicant; and

WHEREAS, The Friend of the Court, District Court and Probate Court all deal with families where children and parents have been exposed to domestic violence and while efforts are made to provide supervised parenting time to these families, resources to provide adequate supervision on weekends and evenings do not exist; and

WHEREAS, The Bay County Women's Center is staffed 24 hours a day and has the resources to provide a supervised setting and the courts requested them to investigate funding for a "safe haven" to exchange children and to provide a safe place for volatile parents or victims to visit with their children; Therefore, Be It

RESOLVED That the Bay County Board of Commissioners authorizes the application to the US Department of Justice for a Safe Havens: Supervised Visitation and Safe Exchange Grant and authorizes the County to act as the fiduciary, to pass-through the funds for the Women's Center, if the grant is awarded; Be It Further

RESOLVED That the Chairman of the Board is authorized to execute the grant documents (application, grant award, all related required documents) on behalf of Bay County following legal review/approval; Be It Further

RESOLVED That the grant applicant/recipient departments are required to work with the Finance Department whose staff will provide financial oversight of said grant; Be It Finally

RESOLVED That related budget adjustments, if required, are approved.

ERNIE KRYGIER, CHAIR
AND COMMITTEE

Probate-Family Court - Safe Haven - Supervised Visitation and Safe Exchange Grant

MOVED BY COMM._____

SUPPORTED BY COMM._____

COMMISSIONER	Y	N	E	COMMISSIONER	Y	N	E	COMMISSIONER	Y	N	E
Michael J. Duranczyk				Joe Davis				Tom Ryder			
Brandon Krause				Ernie Krygier				Christopher Rupp			
Vaughn J. Begick				Kim Coonan				Donald J. Tilley			

VOTE TOTALS:
ROLL CALL: YEAS_____ NAYS_____ EXCUSED_____
VOICE: YEAS_____ NAYS_____ EXCUSED_____

DISPOSITION: ADOPTED_____ DEFEATED_____ WITHDRAWN_____
AMENDED_____ CORRECTED____ REFERRED_____

BAY COUNTY DRAIN COMMISSIONER

JOSEPH RIVET
rivetj@baycounty.net

515 CENTER AVENUE, SUITE 601
BAY CITY, MICHIGAN 48708-5127
drainoffice@baycounty.net

PHONE (989) 895-4290
FAX (989) 895-4292
TDD (989) 895-4049
(HEARING IMPAIRED)

TO: Kim Coonan, Chair, Board of Commissioners

FROM: Joseph Rivet, Drain Commissioner

DATE: February 28, 2012

RE: Soil Erosion and Sedimentation Control Standards

As you are aware, Bay County is designated as a County Enforcing Agency for the State's Soil Erosion and Sedimentation Control Program. You have assigned that function to the Drain Office. The Office of the Bay County Drain Commissioner also has the designation as an Authorized Public Agency (APA), which allows us to work in County Drains without going through the usual construction permitting process.

Recently, MDEQ has approved an APA Procedures Manual for work in county drains developed by the Michigan Association of County Drain Commissioners. The lengthy manual outlines methods and practices to minimize erosion when we work in drains. We believe the manual represents an appropriate approach to addressing this issue and believe it makes sense for Bay County.

MDEQ has asked that the County formally adopt the manual so they have documentation on the approach our office will take to completing earth change work in our drains. I present it to you for consideration as a Board agenda item at your convenience. Given its length, I have attached a single copy for your review. Additional copies can be provided, as hard copy or electronically as necessary.

Thank you for your consideration.

C: D. Beger
T. Hickner
R. Redmond

Soil Erosion and Sedimentation Control

Authorized Public Agency Procedures Manual

Bay County Drain Commissioner

Joseph Rivet

February 2006

FOREWORD

This manual has been prepared to give information and guidance to the Drain Commissioner's personnel and their consultants and contractors who are responsible for soil erosion and sedimentation control during earth change activities conducted under their direction as an Authorized Public Agency (APA) under Section 324.9110 of Part 91, Soil Erosion and Sedimentation Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. If a Drain Commissioner is not an APA, he/she must submit an SESC plan and apply for an SESC permit from the appropriate county or municipal enforcing agent regardless of whether he/she is following the guidelines set forth in the manual. The manual incorporates changes brought about by new technologies, new or revised legislation, and improved materials and processes.

ACKNOWLEDGEMENTS

This Soil Erosion and Sedimentation Control Procedures Manual was made possible by funding from the Great Lakes Basin Grant Program for Soil Erosion and Sediment Control and the Michigan Association of County Drain Commissioners (MACDC).

The document was developed under the direction of a MACDC Special Task Force consisting of the following people:

- Janis Bobrin, President MACDC
- Pat Lindemann, Vice President MACDC
- Abby Eaton, Michigan Department of Agriculture
- Dick Mikula, Michigan Department of Environmental Quality
- Hope Croskey, Spicer Group, Inc.

The task force commends and thanks those Drain Commissioners who spent countless hours writing and editing individual procedure details and others who provided input and insight that was incorporated into the many drafts developed during formulation of the final document. Special appreciation is also given to the many Drain Commissioners' staff whose input made this a practical document that truly can be implemented in the field for the protection of our natural resources.

Credit also belongs to the Michigan Department of Management and Budget and the Michigan Department of Transportation whose staff provided digital copies of their SESC Procedures Manuals, including the digital graphic files, which were used extensively for and during development of this manual.

In addition, we wish to acknowledge the contributions of Hope Croskey and Spicer Group who went above and beyond the contractual obligations required to ensure completion of this document. The Michigan Department of Environmental Quality approved this Manual on February 9, 2006.

TABLE OF CONTENTS

SECTION 1

Program Guidelines

INTRODUCTION

The goal of the Drain Commissioner is to implement SESC measures that are cost effective; will effectively minimize erosion and off-site sedimentation; and will protect the soil, water, and other natural resources when earth change activities are conducted under their authority. Achieving this goal is fundamental to the efficiency and economical service life of drainage and stormwater facilities, and lake level control structures.

A copy of this manual, which includes Part 91, Soil Erosion and Sedimentation Control (SESC), of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Part 91), and the associated administrative rules (Rules) promulgated under Part 91 will be made available to the Drain Commissioner's staff and their contracted personnel who are expected to understand and implement the contents of this manual. This SESC Procedures Manual is adopted by the Drain Commissioner and details the SESC measures that will be utilized during all earth change activities, including maintenance, construction, and restoration activities as an Authorized Public Agency (APA).

Individual Part 91 permits are not required for designated APAs. However, all earth change activities must meet Part 91 and Rule requirements. To maintain this APA status, earth change activities regardless of size or location must be conducted in accordance with these approved SESC procedures unless a variance is requested by the APA and granted by the Michigan Department of Environmental Quality (MDEQ). As standards and/or techniques for SESC evolve, this manual will require modifications that must be approved by the MDEQ prior to formal adoption. Having the APA designation does not exempt the Drain Commissioner from obtaining all other applicable federal, state, and local permits.

COMMITMENT

To maintain the APA designation, the Drain Commissioner is committed to comply with the SESC Procedures while undertaking all earth change activities. This manual presents procedures for conducting earth change activities and implementing SESC measures that fulfill this commitment through stabilization of disturbed soils and preventing off-site sedimentation (downstream of the project limits or outside of the drain easement). Part 91 defines stabilization as the establishment of vegetation or the proper placement, grading, or covering of soil to ensure its resistance to soil erosion, sliding, or other earth movement. The following basic principals will be included in the planning, design, specification, construction, and inspection of drain maintenance and improvement projects that include earth change activities:

1. Inspect and maintain drains, prioritizing maintenance activities that emphasize preventive measures and procedures that will minimize soil erosion and the resulting sedimentation, including but not limited to:

   (a) Disturbing the least amount of soil for the shortest period of time.

   (b) Encourage and maintain vegetated buffer strips whenever possible.

   (c) Repair blowouts, seeps and slumped areas along a drain as soon as possible.

(d) Evaluate if dredging only specific reaches of a drain would provide effective drainage rather than dredging the entire drain.

(e) Remove obstructions and sediment which are causing scouring and other erosive forces.

(f) Establish stable streambank slopes that can withstand anticipated flow at non erosive velocities.

2. In non-emergency situations, conduct earth change activities during the time of year and flow conditions that will minimize erosion and the resulting sedimentation.

3. Provide control measures that will effectively control erosion of, and sediment from, the exposed area, and stabilize disturbed areas, except for actively cultivated agricultural fields, either temporarily or permanently, as soon as possible. Seed, apply mulch when necessary, or otherwise stabilize disturbed drain banks daily. During hydraulic or mechanical dredging, spread spoils to prevent erosion and ditch bank surcharge and seed or otherwise stabilize spread spoils within five days unless spoils are being spread in actively cultivated agricultural fields. If spoils will be spread at a later date either place spoils where surface runoff from the spoil piles will drain away from the drain; or seed, apply mulch when necessary, or otherwise stabilize spoil piles within five days.

4. During the non-growing season when vegetation cannot be established, additional control measures will be implemented to ensure the prevention of soil erosion and off-site sedimentation. These measures may include, but are not limited to, silt fence, erosion control blankets, various geosynthetic products, polyacrylamides, and/or other BMP's that will ensure the temporary stabilization of the soil until the next growing season when permanent vegetation can be established. The increased need and cost for additional soil erosion and sedimentation control measures during the non-growing season will be considered in planning for projects that start or finish in late fall or winter.

5. Install and maintain adequate, temporary or permanent, SESC measures prior to commencing other earth change activities. Temporary SESC measures shall be installed and functioning prior to commencement of earth change activities and shall be removed only after permanent SESC measures are in place, functioning, and the site has been stabilized.

6. Where feasible, design channel and drain bank slopes that will be easily stabilized for the site specific soil types and anticipated flow velocities.

7. Select a route and course for new drains that will achieve project objectives while minimizing soil erosion, taking into consideration areas with unstable soils and wetland complexes. Establish adequate right-of-ways for construction and future maintenance operations.

8. Minimize erosion and control sediment at points of concentrated flow or grade changes utilizing appropriately designed and installed SESC measures.

NOTIFICATION OF PROPOSED EARTH CHANGE

As an APA, individual permits are not required from the applicable County or Municipal Enforcing Agency. However, Part 91 requires an APA to notify the applicable county or municipal enforcing agency of each proposed earth change that would have required a SESC permit [See Rule 323.1706 (4)]. The complete list of County and Municipal Enforcing Agencies is available on the MDEQ website.

SESC CERTIFICATE OF TRAINING

Section 324.9110 (4) (b) of Part 91 requires those individuals with decision-making authority who are responsible for administering the Drain Commissioner's SESC Program have current certificates of training under section 324.9123. Therefore, all Drain Commissioner personnel who make decisions regarding the design, inspection, or implementation of SESC measures must have a valid Certificate of Training. A certificate can be obtained by completing the MDEQ's SESC training class or the self study training and passing the final exam. This requirement applies to the following positions that have decision-making authority: Drain Commissioner, Surveyor/Engineer, Drain Maintenance Staff

PLANNING PHASE

Effective erosion and sediment control begins with planning, including designing and locating projects to best meet each project objective while minimizing the potential for erosion and avoiding sensitive and high erosion potential areas when feasible. Installation and maintenance of properly designed SESC measures and conducting routine maintenance activities prevent erosion and control sediment. This manual provides procedures for the design, implementation, and maintenance of individual SESC measures, as well as information for developing SESC plans.

Per the guidelines provided in this manual, some Routine Maintenance Activities in Section 6 require a SESC plan when the earth disturbance exceeds 100 linear feet. The specific activities include: 81. Sediment Removal; 84. Vegetation Removal with Selective Grubbing; and 85. Slope and Streambank Stabilization. All Construction and Restoration Activities in Section 7 require a SESC plan. See the specific procedures for further guidance.

In addition, several of the SESC measures identified in Sections 3, 4, and 5 of this manual involve earthwork that would normally require a SESC plan prior to implementation. However, a SESC plan is not required for those SESC measures involving earthwork if they are installed in accordance with this manual's guidelines identified under the "How" for each SESC measure and the total earthwork associated with implementing one or more measures does not exceed 100 linear feet of disturbance. Any deviation from the manual guidelines or earthwork resulting in a disturbance in excess of 100 linear feet will require that a SESC plan be developed prior to initiating the earthwork.

When a drain activity or SESC measure requires a SESC plan, a plan shall be developed to effectively reduce accelerated soil erosion and sedimentation. The plan shall identify factors that may contribute to soil erosion or sedimentation or both. The plan shall include, but not be limited to, the following:

1. A map or maps at an adequate scale to illustrate the:
   - (a) Extent of the earth change activities;
   - (b) Existing and any proposed drain locations;
   - (c) Proximity of proposed earth change to lakes, streams or drains;
   - (d) Predominant land features; and
   - (e) Contour intervals or slope descriptions.
2. A soils survey and the associated soil types or a written description of the general soil types of the exposed land area contemplated for the earth change.

3. Details for proposed earth changes including all of the following:

(a) A description and the location of the physical limits of each proposed earth change.

(b) A description and the location of all existing and proposed on site drainage and dewatering facilities.

(c) The timing and sequence of each proposed earth change.

(d) The location and description for installing and removing all proposed temporary SESC measures.

(e) A description and the location of all proposed permanent SESC measures.

(f) Proposal for continued maintenance of all permanent SESC measures.

DESIGN PHASE

It is the responsibility of the Drain Commissioner to ensure that a project is designed correctly. A staff engineer or engineering consultant and/or qualified professionals shall be utilized during the design phase when required in the details for a specific SESC measure. The project design should minimize adverse impacts to areas with high erodible soils or areas next to lakes, streams, or wetlands while incorporating project specific permit requirements. Those responsible for recommending SESC measures need to specify control measures that are practical, reasonable and effective during the construction phase of a project to achieve adequate SESC. The design plans, included as part of the contract documents, must clearly indicate the location and installation details for all appropriate SESC measures.

CONTRACT DOCUMENTS

As an APA, the Drain Commissioner is ultimately responsible for conducting and documenting SESC inspections and assuring that all earth change activities undertaken by their staff or contractors working under their APA designation meet the requirements of Part 91, the Rules, and this Manual. Therefore, the Drain Commissioner shall ensure that all contract documents include a clear description of the contractor's responsibilities including: compliance with this manual, by reference; installation, and ongoing monitoring and maintenance of site specific SESC measures by the contractor until all disturbed areas are stabilized and temporary SESC measures are removed. The contract document must provide the ability to adapt, adjust and add SESC measures necessary to maintain a level of SESC required to comply with Part 91, the Rules, this manual, and other project specific permit requirements.

Contract documents must clearly state the authority of the Drain Commissioner to enforce compliance with Part 91, the Rules, and this manual, and the consequences for noncompliance. To assist with contractor compliance, contract documents should also include, but not be limited to, the following:

1. Acquisition of cash, a certified check, an irrevocable bank letter of credit or a surety bond acceptable to the county in the amount sufficient to assure the installation and completion of such protective or corrective measures, and/or site restoration, as may be required by the Drain Commissioner to assure compliance with Part 91, the Rules, and this manual.

2. The ability of the Drain Commissioner to expend these funds if, in the opinion of the Drain Commissioner, the site may result in or contribute to soil erosion or sedimentation of adjacent

1. Note the deficiencies, including maintenance requirements and corrective actions, on the Inspection Form being specific about the type and location of the deficiencies.

2. Advise the contractor or responsible Drain Commissioner personnel of the deficiencies and provide sufficient verbal or written instructions to ensure a complete understanding of the deficiencies and the necessary corrective actions. These instructions may include a work order, a revised SESC plan, or reference to specific SESC measures.

3. Specify an appropriate time frame with which to complete the corrective actions. Deficiencies which are determined to be of an emergency nature must be corrected within 24 hours. Examples of deficiencies deemed an emergency are sedimentation of the waters of the state and erosion of or sediment on a roadway which could jeopardize public safety. Deficiencies which are not considered an emergency should be corrected within five days.

CORRECTIVE ACTIONS

Contracted Projects

In the event that the Drain Commissioner's personnel or their contracted inspector, is unsuccessful in getting a contractor to perform corrective actions, the Drain Commissioner will assume responsibility for ensuring that SESC corrective actions are implemented. The following progressive steps shall be taken if a contractor fails to comply with their contract or Part 91 regulations.

1. Issue or reissue a work order describing the work to be completed by the contractor specifying a completion date.

2. Issue a Notice of Non-Compliance with Contract Requirements for failure to respond to SESC corrective actions in a timely manner.

3. Contract with another specialty contractor to complete the required corrective actions to ensure compliance with regulations.

4. Prepare and place on file a Contractor Evaluation to document the contractor's inability to meet contract obligations and implementation of required SESC measures.

In-House Projects

SESC corrective actions will be implemented and, when necessary, the appropriate disciplinary action will be taken.

FORMS

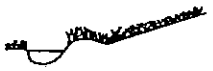
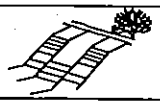
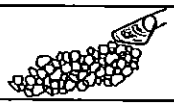
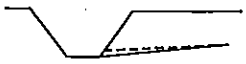
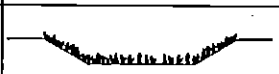
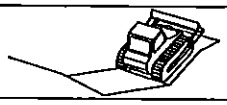
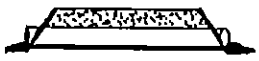
The following forms shall be used for the administration of the SESC Program.

1. SESC Inspection Log
2. SESC Plan Checklist
3. SESC Inspection Report Form

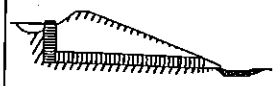
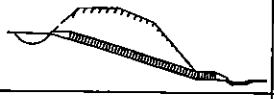
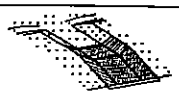
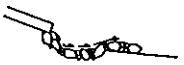
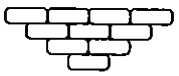
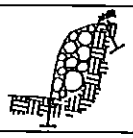
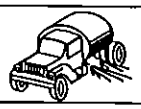
SECTION 2

MACDC Keying System

3. EROSION CONTROL MEASURES

KEY	SESC MEASURE	SYMBOL	WHERE USED
1	SEEDING		When bare soil is exposed, temporarily or permanently, to erosive forces from wind and or water on flat areas, mild slopes, grassed waterways and spillways, diversion ditches and dikes, borrow and stockpile areas, and spoil piles.
2	MULCH		On flat areas, mild slopes, grassed waterways and spillways, diversion ditches and dikes, borrow and stockpile areas, and spoil piles when areas are subject to raindrop impact, and erosive forces from wind or water.
3	SODDING		When a temporary or permanent vegetative cover is necessary or desired to prevent soil erosion and filter sediment in residential, commercial or high traffic areas; or on steep slopes, auxiliary spillways, and grassed swales
4	SLOPE ROUGHENING AND SCARIFICATION		On disturbed slopes and stream or drain banks when site grading or construction activities result in grades that may cause increased erosive velocities or off-site sedimentation.
5	PLASTIC SHEETING OR GEOTEXTILE COVER		As a temporary measure to line a channel, cover stockpile areas or to provide immediate cover on exposed slopes
6	SOIL BINDING POLYMERS	 Erosion Control	Over all exposed soil surfaces or prepared seed beds that need protection from precipitation impact, sheet flow, rill flow or wind prior to erosive force impact.
7	RIPRAP		Along drain banks, shorelines, or where concentrated flows occur. Slows velocity, reduces erosion and sediment load.
8	RIPRAP TOE OF SLOPE		Riprap and toe of slope protection is used in areas where velocities are causing drain bank erosion and are too high to stabilize using other methods
9	OUTFALL STABILIZATION		In the stream or drain bank usually above the ordinary high water mark where an enclosed drain or tile discharges to an open drain.
10	SIDE DITCH OUTLET		In a ditch or drain just upgradient from the discharge into a stream or open drain to prevent erosive velocities.
11	GRASSED WATERWAYS		In intermittent streams or drains and constructed ditches and drainage swales where flow velocities and channel grades do not warrant armoring the channel with riprap or cobble
12.1	TEMP CROSSING - FORD DRAIN		Where access to the opposite side of a drain is temporarily required and crossing the drain by fording will result in less damage than constructing a crossing.
12.2	TEMP CROSSING - NATIVE SOIL FORD		Where access to the opposite side of a drain is temporarily required and the crossing location will be dredged and stabilized the same day.
12.3	TEMP CROSSING - TIMBER FORD		Where access to the opposite side of a drain is temporarily required and timbers are available for use as a temporary crossing.
12.4	TEMP OR PERMANENT CROSSING - ROCK FORD		Where access to the opposite side of a drain is temporarily or permanently required and installation will require minimum bank excavation.
12.5	TEMP CROSSING - TEMP CULVERT		Where access to the opposite side of a drain is temporarily required and the channel is narrow and can accommodate a culvert with minimum backfill.
12.6	TEMP CROSSING - TEMP BRIDGE		Where access to the opposite side of a drain is temporarily required and the banks are stable and can support a bridge deck.

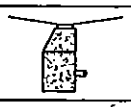
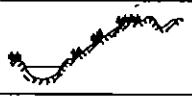
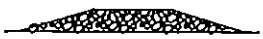
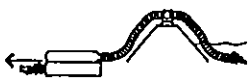
3. EROSION CONTROL MEASURES (CONTINUED)

KEY	SESC MEASURE	SYMBOL	WHERE USED
13	PIPE DROP SPILLWAY		Where surface runoff accumulates at the top of a slope and must be conveyed, either temporarily or permanently, from a higher to lower elevation within a short horizontal distance, down steep slopes, or when soils are highly erodible or excessively wet. Also used when velocities must be reduced to prevent channel scour or drain bank erosion at the outlet.
14	SLOPED PIPE SPILLWAY		Where surface runoff accumulates at the top of a slope and must be conveyed to a lower elevation without causing slope erosion, gully formation, slope failure, or channel scour.
15	ARMORED SPILLWAY		When concentrated flow must be conveyed down a drain bank or slope or discharge into another drain. Where slope failure or channel scour is observed or is likely to occur, or when runoff must be redirected around work in the drain.
16	REINFORCED VEGETATED SPILLWAY		When slope failure at eroded outfalls are observed or are likely to occur from concentrated runoff on very shallow slopes (where flow velocities will be low enough not to undermine the reinforced grass root structure).
17	TOE DRAIN		Were piping is causing erosion and unstable drain banks.
18	TEMPORARY BYPASS CHANNEL		In and adjacent to a stream when flow conditions prevent completing work activity without diverting flow around a work area
19.	ENERGY DISSIPATORS		Where the discharge velocity of concentrated flow exceeds the erosive velocity of the receiving area or channel.
20	CONCRETE BAG RIPRAP HEADWALL		At culvert ends as a headwall when culvert backfill is eroding or a longer culvert is impractical.
21	SHEET PILING		As a permanent measure in locations where a vertical bank is required and other erosion control measures have failed. As a weir. As a temporary cofferdam during construction.
22	SAND OR STONE FILLED BAGS		Within or adjacent to a stream to isolate or divert flow during construction. Can also be used to temporarily impound water for very short time periods.
23	TREE REVETMENT		Where stream banks are eroding or undercutting. The placement of trees or tree tops along the edge of the stream provides a place for sediment to settle out behind the trees when water levels recede. The sediment remains in place behind the logs and allows a stream to "naturally" rebuild its banks.
24	LOG REVETMENT		Where stream banks are eroding or undercutting. The placement of logs along the edge of the stream provides a place for sediment to settle out behind the logs when water levels recede. The sediment remains in place behind the logs and allows a stream to "naturally" rebuild its banks
25	GABION BASKETS		At the toe of steep slopes and drain banks within or adjacent to the stream channel when Flow velocities are resulting in major drain bank or slope failure or instability and slope and drain bank reshaping with or without riprap is not practical.
26	DUST CONTROL		As a temporary measure on exposed and unstabilized areas that must be protected from wind or water erosion.
27	LIVE STAKING		Slopes and drain banks, wetland buffer and reservoir drawdown areas. In areas requiring stabilization but with limited access for equipment or when little site disturbance is required.
28	WATTLES		Where a slope or streambank requires stabilization and minimal disturbance is preferred or the site has limited access.

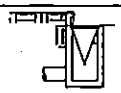
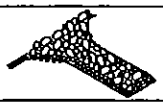
3. EROSION CONTROL MEASURES (CONTINUED)

KEY	SESC MEASURE	SYMBOL	WHERE USED
29	CELLULAR CONFINEMENT SYSTEMS		On steep slopes and stream or drain banks and in high velocity vegetated channels.

4. EROSION AND SEDIMENT CONTROL MEASURES

KEY	SESC MEASURE	SYMBOL	WHERE USED
40	CHECK DAM		In constructed and existing flow corridors to reduce flow velocities.
41	CATCH BASIN		Where surface water accumulates and needs an outlet or an open drain discharges to a stream or drain at erosive velocities. Within an enclosed drain system to provide an inlet and a sump.
42	VEGETATED BUFFER STRIPS		Along stream and drain corridors, sensitive areas, and shorelines when earth changes will occur during a drain maintenance or improvement project or when an eroding bank or drain easement area needs to be stabilized.
43	DIVERSION DIKE		Runoff needs to be diverted around sensitive areas, unstable or easily eroded soils, bare soils, away from steep banks, or around earth change activities.
44	DIVERSION DITCH		Runoff needs to be intercepted and or diverted around sensitive areas, unstable or easily eroded soils, bare soils, away from steep banks, or around earth change activities.
45	DIVERSION DITCH AND DIKE		Within existing flow corridors to divert runoff, temporarily or permanently, around sensitive areas, unstable or easily eroded soils, steep banks, along narrow drain easements or around maintenance or improvement activities.
46	STONE FILTER BERM		When runoff must be filtered prior to entering a lake, stream, drain or wetland. Never use in place of a check dam in a flowing stream.
47	SAND FENCE		In areas susceptible to wind erosion, particularly where the soil has not yet been stabilized by other means. To re-build a slope.
48	DEWATERING		When construction or maintenance activities are limited by the presence of water and a dry work area is required.
49	STRAW BALES		As a temporary diversion structure. Occasionally as an alternative to silt fence for projects that will be completed within a very short time period (less than one month).

5. SEDIMENT CONTROL MEASURES

KEY	SESC MEASURE	SYMBOL	WHERE USED
60	STORM DRAIN INLET PROTECTION		Around the entrance to a newly constructed catch basin or an inlet that will capture runoff from an earth change activity.
61	SILT FENCE		As a temporary measure used to capture sediment from sheet flow. May also divert small volumes of sheet flow to protected outlets.
62	SEDIMENT BASIN		When working in the drain, or drain easement. In streams or drains where sediment sumps are inadequate.
63	SEDIMENT SUMP (TRAP)		When working in the drain, or drain easement and the soil disturbance and anticipated sediment is limited.
64	POLYMER FLOCCULANTS	 Sediment Control	Where turbid water can be collected and suspended sediments removed prior to discharging runoff to a lake, stream, drain, or a wetland or runoff leaves the drain easement.
65	TURBIDITY CURTAIN		Within a stream or drain parallel to flow when a slack water area is necessary to isolate earth change activities from a lake or channel.
66	STABILIZED CONSTRUCTION ACCESS		At locations where construction equipment will enter and exit the drain easement and tracking of soil is anticipated.

6. ROUTINE MAINTENANCE ACTIVITY DETAILS

KEY	BEST MANAGEMENT PRACTICE
80	Debris Removal
81	Sediment Removal
82	Stormwater Basin Maintenance
83	Vegetation Removal Without Grubbing
84	Vegetation Removal With Selective Grubbing
85	Slope and Streambank Stabilization
86	Drain Crossing Maintenance
87	Enclosed Drain Maintenance
88	Culvert Repair

7. CONSTRUCTION & RESTORATION ACTIVITY DETAILS

KEY	BEST MANAGEMENT PRACTICE
100	Stormwater Basin Construction
101	Drain Relocation
102	Drain Enclosure
103	Drain Crossing
104	Weir Installation
105	Beaver Dam Removal
106	Low Flow Channel
107	Floodway Shelf
108	Riffle Zones
109	Pools
110	Meanders
111	Cross-Vanes
112	J-Hook Vanes

SECTION 3

Erosion Control Measures

1. SEEDING

When	• Bare soil is exposed to erosive forces from wind and or water.
Why	• A cost effective way to prevent erosion by protecting the soil from raindrop impact, flowing water and wind. • Vegetation binds soil particles together with a dense root system, increasing infiltration thereby reducing runoff volume and velocity.
Where	• On all disturbed areas except where non-vegetative stabilization measures are being used or where seeding would interfere with agricultural activity.
Scheduling	• During the recommended temporary and permanent seeding dates outlined below. • Dormant seeding is acceptable.
How	1. Site Assessment. Determine site physical characteristics including available sunlight, slope, adjacent topography, local climate, proximity to sensitive areas or natural plant communities, and soil characteristics such as natural drainage class, texture, fertility and pH. 2. Seed Selection. Use seed with acceptable purity and germination tests that are viable for the planned seeding date. Seed that has become wet, moldy or otherwise damaged is unacceptable. Select seed depending on, location and intended purpose. A mixture of native species for permanent cover may provide some advantages because they have coevolved with native wildlife and other plants and typically play an important function in the ecosystem. They are also adapted to the local climate and soil if properly selected for site conditions; can dramatically reduce fertilizer, lime and maintenance requirements; and provide a deeper root structure. When re-vegetating natural areas, introduced species may spread into adjacent natural areas, native species should be used. Noxious or aquatic nuisance species shall not be used (see list below). If seeding is a temporary soil erosion control measure select annual, non-aggressive species such as annual rye, wheat, or oats. See MDEQ's *"Guidelines for Vegetative Erosion Control"* or the *USDA-NRCS-MICH "Critical Area Planting Guide 342-1"* for specific seeding rates by species. 3. Site Preparation. Final grade or shape area to be seeded. Remove large clods, rocks, tree roots, etc. that will interfere with seeding. A spring tooth drag, field tiller, disk or other suitable equipment may be used. When feasible, replace the topsoil after grading. If soils are compacted, scarify or rake seedbed to a minimum depth of 3 inches and roughen slopes steeper than 3 horizontal to 1 vertical. If needed, divert concentrated flows away from seeded areas until vegetation is established. 4. Soil Amendments. Properly sited native vegetation should not require fertilization and, in such instances, fertilizing may promote competition from unwanted species at the expense of natives. Do not apply nitrogen for warm season mixes. If fertilizer is needed, fertilize with a low or no phosphorus fertilizer when near water, and/or add lime only when necessary for proper establishment and maintenance of vegetation. Conduct a soil test to determine required soil amendments if having difficulties with vegetation establishment. See Soil Amendments Table below. 5. Seeding. Apply seed as soon as possible, but within 5 days, after final grading, shaping, and/or seedbed preparation by hand broadcasting, hydroseeding, or using mechanical drills following seeding dates outlined below. Water as needed or possible for successful germination. Apply temporary seeding to disturbed areas within 5 days if final grading and permanent seeding will be delayed for more than 5 days. Apply temporary

	seed daily to dredged spoil piles that will be flattened at a later date if they do not slope away from the drain except where they will interfere with plowing tilling or the harvesting of crops. Seed streambanks daily and other disturbed areas within 5 days. 6. Dormant fall seeding. In late fall after the soil temperature remains consistently below 50°F prior to the ground freezing. No seed germination will take place until spring therefore mulch or another stabilization technique may be required to prevent erosion and off-site sedimentation. A cool season annual grass may be added in an attempt to have some fall growth. 7. Dormant winter seeding. Apply seed daily to disturbed areas and dredged spoil piles before they freeze. Seed will germinate in the early spring. 8. ***Mulch*** is recommended for dormant fall and winter seeding and on all slopes, unstable soils, heavy clay soils and all areas adjacent to wetlands, streams, drains, or sensitive areas and should be applied immediately after seeding. 9. Protect seeded areas from pedestrians and vehicular traffic.
Maintenance	• Inspect newly seeded areas subsequent to anticipated germination date and after each significant rainfall event that produces runoff until areas are stabilized. • Repair eroded areas, applying supplemental seed, mulch and water as needed. • If seed does not establish, conduct soil tests, amend soils as needed, and reapply seed and/or mulch during the recommended growing season. • To assist in the establishment of native species remove unwanted competing vegetation in the first year. • Mowing can be used periodically to discourage weeds.
Limitations	• Soil is susceptible to erosion until seedbeds are established. Sites may require re-seeding. • Seasonal limitations include excessive heat or early frost/freeze and adequate moisture for germination and early growth. • May not be appropriate in high traffic areas. • Native species may be more costly, however, the increased awareness of the benefits of planting native species is beginning to reduce their price and increase their availability.

TEMPORARY SEEDING DATES

Seed Type	Lower Peninsula south of US 10	Lower Peninsula north of US 10	Upper Peninsula	Amount (lbs. per)	
				1000 sq. ft.	Acre
Oats, Barley	April 1 - Sept. 15	April 15 - Aug. 1	May 1- Aug. 1	2	96
Cereal Rye	Aug. 1 - Oct. 15	Aug. 1 - Oct. 10	Aug. 1 - Nov. 1	3	120
Wheat	Sept. 20 - Oct. 15	Sept. 10 - Oct. 10	Sept. 10- Oct. 1	3	120
Buckwheat	June 1 - July 15	June 1 - July15	June 15 - July15	2	75
Perennial Ryegrass	Aug. 1 - Oct. 15	June 1 - Aug. 1	Aug. 1 - Oct. 1	0.5	20

Source: Adapted from USDA NRCS Technical Guide #342 (1999)

PERMANENT SEEDING DATES

Seeding Conditions	Lower Peninsula south of US 10	Lower Peninsula north of US 10	Upper Peninsula
Permanent Seeding with irrigation or mulch.	April 1 - Oct. 10	May 1 - Oct. 1	May 1- Sept. 10
Permanent Seeding w/o irrigation or mulch	April 1 - May 20 Aug. 10 - Oct. 10	May 1 - June 10 Aug. 1 – Oct. 1	May 1 - June 15 Aug. 1 - Sept. 20
Dormant Seeding	Nov. 1 - Freeze	Oct. 25 - Freeze	Oct. 25 - Freeze

Source: Adapted from USDA NRCS Technical Guide #342 (1999)

SOIL AMENDMENTS

Lime	Nitrogen (N)	Phosphorous (P2O5)	Potash (K20)
As needed*	50-60 lbs/acre 1.25 lbs/1000 sq ft	50-60 lbs/acre 1.25 lbs/1000 sq ft	50-60 lbs/acre 1.25 lbs/1000 sq ft
If seeding with legumes, soils should be limed, if needed, to pH of 6.5 to 7.0. If seeding without legumes, a pH of 5.5 is adequate. Legume seeds must be freshly inoculated with the proper nitrogen fixing bacteria, within 24 hours prior to seeding.			

Source: USDA-NRCS-MICH Technical "Critical Area Planting 342"

NOXIOUS OR AQUATIC NUISANCE SPECIES

Act 359 of 1941 , Identifies the following noxious weeds

Canada thistle, Cirsium arvense
Dodder, Cuscuta species
Mustards (charlock, black mustard, Indian mustard, species of Brassica or Sinapis)
Wild carrot, Daucus carrota
Bindweed, Convolvulus arvensis
Perennial sowthistle, Sonchus arvensis
Hoary alyssum, Berteroa incana
Ragweed, Ambrosia elatior
Poison ivy, Rhus toxicodendrum
Poison sumac, Toxicodendron vernix

R 285.715.7 Prohibited and restricted noxious weeds.

Rule 7. (1) All of the following are prohibited noxious weeds:

(a) Field bindweed, Convolvulus arvensis.
(b) Hedge bindweed, Convolvulus sepium.
(c) Canada thistle, Cirsium arvense.
(d) Morning glory, Ipomoea species.
(e) Puncturevine, Tribulus terrestris.
(f) Plumeless thistle, Carduus acantholdes.
(g) Musk thistle, Carduus nutans.
(h) Bull thistle, Cirsium vulgare.
(i) Perennial sowthistle, Sonchus arvensis.
(j) Whitetop = hoary cress = perennial peppergrass, Cardaria draba.
(k) Russian knapweed, Centaurea picris.
(l) Spotted knapweed, Centaurea maculosa.
(m) Leafy spurge, Euphorbia esula.
(n) Quackgrass, Agropyron repens = Elytrigia repens.
(o) Johnsongrass, Sorghum halapense, including sorghum almum and seed which cannot be readily distinguished from Johnsongrass.
(p) Dodder, Cuscuta species.

(q) Horsenettle, Solanum carolinense.
(r) Yellow nutsedge, Cyperus esculentus, both seed and tubers.
(s) Serrated tussock, Nasella trichotoma.

(2) All of the following are restricted noxious weeds:
(a) Fanweed, Thlaspi arvense.
(b) Black mustard, Brassica nigra.
(c) Charlock, Sinapis arvensis.
(d) Indian mustard, Brassica juncea.
(e) Wild radish, Raphanus raphanistrum.
(f) Hoary alyssum, Berteroa incana.
(g) Buckhorn plantain, Plantago lanceolata.
(h) Wild carrot, Daucus carota.
(i) Wild onion, Allium canadense.
(j) Wild garlic, Allium vineale.
(k) Giant foxtail, Seteria faberii.
(l) Yellow rocket, Barbarea vulgaris.
(m) Curled dock, Rumex crispus.
(n) Velvetleaf, Abutilon theophrasti.
(o) Wild oat, Avena fatua.
(p) Jimsonweed, Datura stramonium.
(q) Cocklebur, Xanthium strumarium.
(r) Nightshade complex, including all of the following Solanum species and any other species with indistinguishable seed:
(i) Bitter nightshade, Solanum dulcamara.
(ii) Black nightshade, Solanum nigrum.
(iii) Eastern black nightshade, Solanum ptycanthum.
(iv) Silverleaf nightshade = purple nightshade, Solanum eleagnifolium.
(v) Hairy nightshade, Solanum sarrachoides.

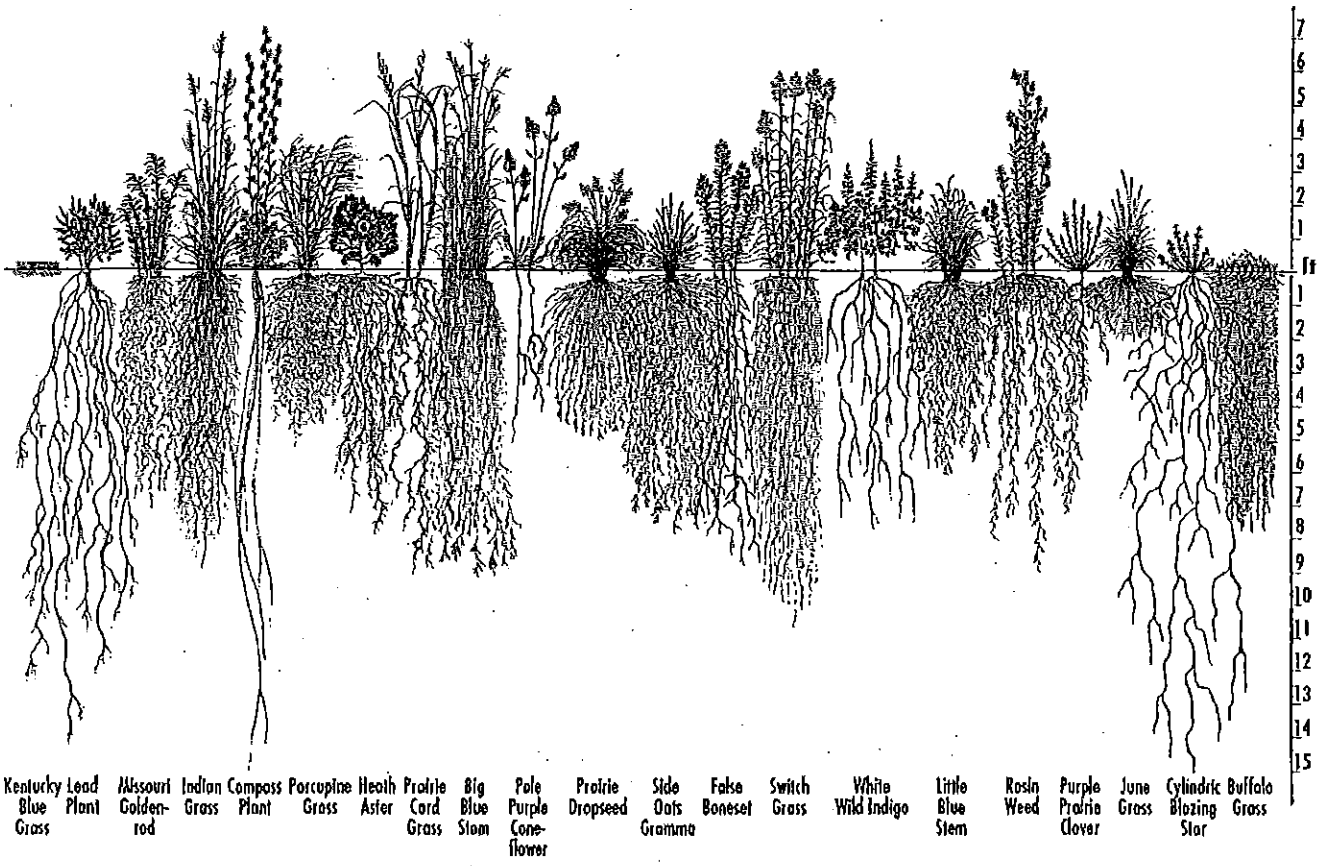
Source: MDA website: www.michigan.gov/mda search on "noxious weeds"

Aquatic Nuisance Species identified by the MDEQ include:
Purple loosestrife, Lythrum salicaria
Eurasian watermilfoil, Myriophyllum spicatum

Evasive Plants Identified by Washtenaw County Drain Commissioner:

Autumn olive, Elaeagnus umbellata
Barberry, Berberris spp.
Buckthorn
Common buckthorn, Rhamnus cathartica
Glossy "Tall hedge" Buckthorn, Rhamnus frangula
Crown vetch, Coronilla varia
European alder, Alnus glutinosa
Honeysuckle,(Lonicera tatarica, L. japonica, L. maackii, L. morrowi, L. x-bella & their cultivars
Multiflora rose, Rose multiflora
Norway Maple, Acer platanoides
Oriental bittersweet, Celastrus orbiculatus
Periwinkle (Myrtle), Vinca minor
Privet, Ligustrum vulgare
Purple loosestrife, Lythrum salicaria
Siberian elm, Ulmus pumila

NATIVE SPECIES



"Native landscaping uses only plants indigenous (or "native") to the area. Once established, this low-maintenance form of landscaping provides habitat for many birds, butterflies and other wildlife. Thanks to their extensive, deep root system, native landscapes hold rain and survive drought much better than non-native plants and turf grass. Native landscapes are becoming more common. A popular technique is to reduce lawn sizes and use native landscaping for attractive borders. Because native plants have adapted to local soils and pests, they require less watering and need no chemicals or fertilizers to protect them. Unfertilized landscapes mean less contamination of waterways."

Source: Heidi Natura & Conservation Research Institute

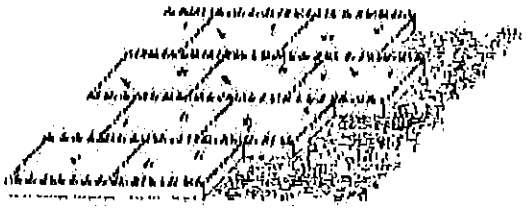
2. MULCH

When	• Protection against raindrop impact, runoff or wind is needed to prevent erosion or loss of seed. • Moisture retention and temperature control are required for seed germination.
Why	• Cost effective way to protect seeded and non-seeded areas and slopes against erosion from rain or wind. Holds soil moisture to allow for seed germination and reduces wind desiccation of germinated seeds. Inhibits seed consumption by birds.
Where	• On flat areas, drain banks, slopes, ***vegetated channel and spillway, diversion ditch and dike***, and borrow and stockpile areas.
Scheduling	• Year around.
How	1. Install other surface runoff control measures, compact soil as required, final grade and seed or install vegetation sprigs prior to mulching. 2. Select mulch material appropriate for the site characteristics including slope, expected flow, level of traffic, installation method, accessibility and length of time protection is needed. Place loose mulch open enough to allow some sunlight and air to penetrate to the soil but thick enough to shade the ground, conserve soil moisture and prevent or reduce wind and water erosion. 3. On flat and mild slopes (less than 2 horizontal to 1 vertical) with no concentrated flow, straw or hay may be used. Spread clean (no invasive or noxious species), dry straw or hay uniformly at a rate of 1-1/2 to 2 tons per acre or 100 lbs. (2-3 bales) per 1000 square feet. Other organic materials may be used where acceptable rates can be established. For native plantings, only the cleanest straw mulch should be applied; hay should not be used. If hydraulic mulches are used, bonded fiber matrixes, which include a tackifier, are preferred. 4. On slopes steeper than 2 horizontal to 1 vertical or areas with concentrated flow apply mulch or other approved material other than loose straw. Mulch should be anchored with, a tackifier, mulch-anchoring disks, crimping with a mulch crimping tool or by placing and stapling netting over the mulch. 5. Mulch blankets are effective in controlling erosion on steeper slopes, grassed waterways and spillways, diversion ditches and dikes, borrow and stockpile areas, and flat areas and slopes during the winter. ♦ On ***grassed waterways, spillways***, and ***diversion ditches*** unroll the mulch blanket across the channel and/or slope and toe or trench in 6 inches deep at the top edge of the mulch blanket. When mulch blankets must be overlapped in the direction of flow always install the downstream blanket first overlapping the upstream blanket on top a minimum of 12 inches and secure the joints with staples or stakes. ♦ On flat areas and slopes, drain banks, borrow areas and stockpiles unroll the mulch blanket, linearly along the slope at roughly the same elevation, installing the lower blanket first. Toe or trench in at the top edge of each blanket 6 inches deep, overlap the next layer a minimum of 12 inches and secure the joints with staples or stakes.

Maintenance	• Inspect mulched areas routinely and after each significant rainfall event to check for movement or erosion until areas are stabilized. If washouts or erosion occur, repair the surface, re-seed and re-mulch. Continue inspections as necessary until vegetation is firmly established. • Keep vehicular and pedestrian traffic and concentrated runoff away from mulched areas until they are well established. • Mulch effectively controls erosion for at least three months, but can be windblown or washed out.
Limitations	• Mulch can be blown or washed away if not secured. • Tackifiers are slippery when wet. Equipment must be kept clean to prevent accidents. Tackifiers can also mark vehicles, signs, or other objects if these items are not protected. • For native plantings only the cleanest straw should be applied; hay should not be used. • Mulch blankets and anchors may inhibit mowing.

3. SODDING

When	• An immediate, temporary or permanent, vegetative cover is necessary or desired.
Why	• To prevent soil erosion • To provide immediate site restoration.
Where	• In residential, commercial or high traffic areas. • On steep slopes, auxiliary spillways, and grassed swales.
Scheduling	• During the growing season.
How	1. Final grade, add topsoil if necessary, and scarify area prior to laying sod. 2. Lay sod in a staggered pattern aligning angled edges so the sod lays flush. 3. On slopes steeper than 3 horizontal to 1 vertical or in concentrated flow areas, the sod shall be pegged with wooden pegs, spaced not over 2 feet apart, in any direction, and shall be driven flush with the sod surface. 4. Water sod until roots have established. 5. Use sod grown on soils reasonably close to the site soil type.
Maintenance	• Water regularly. • Inspect weekly and following each significant precipitation event that results in runoff for slippage and gullies, make repairs and secure as needed until well established. • Heavy maintenance equipment should not be used until the sod is established
Limitations	• Requires irrigation. • Cost. • Does not work well in concentrated flow areas. • Shallow root structure is susceptible to slipping, gullying and failure. • Requires high maintenance to establish on steep slopes.



Correct

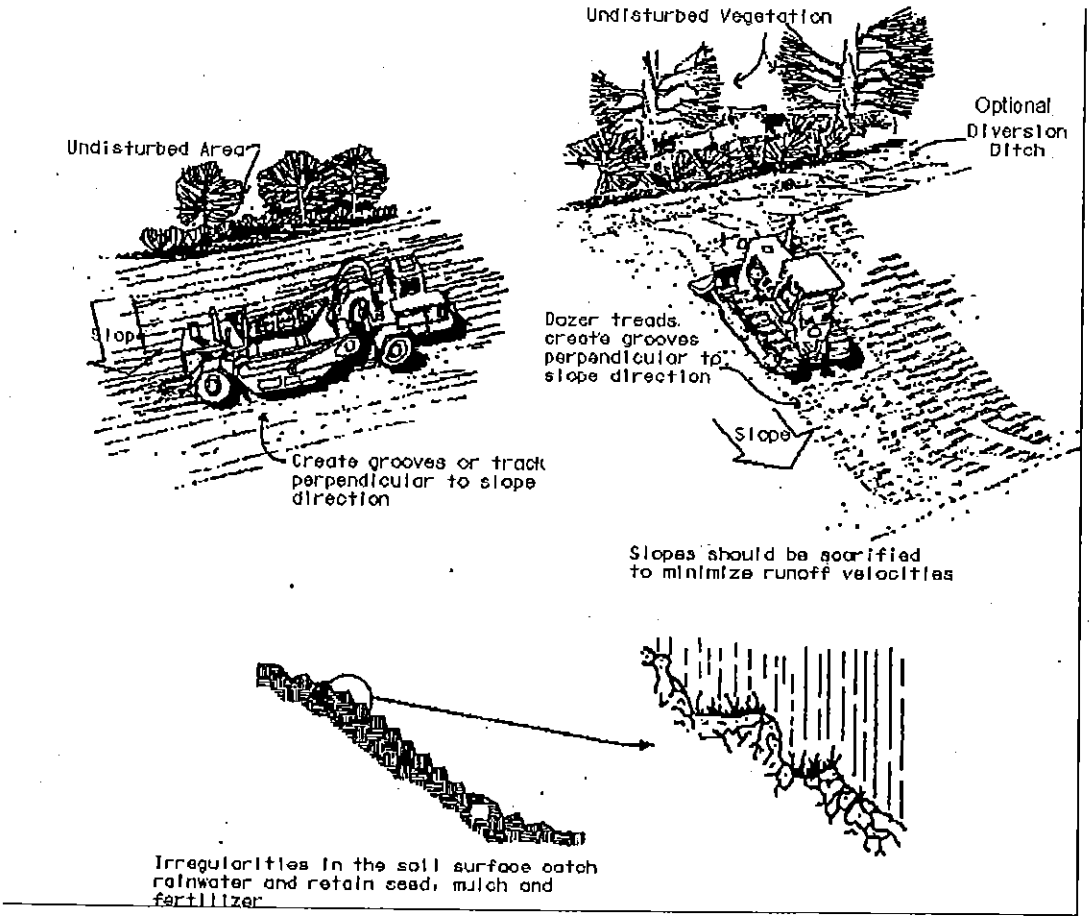
Incorrect

Lay sod in a staggered pattern with strips butted tightly against each other matching angled ends correctly. A sharpened mason's trowel can be used to tuck down the ends and trim pieces.

Source: Michigan Department of Transportation

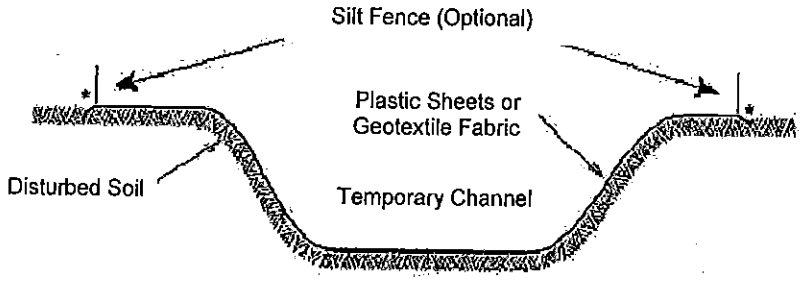
4. SLOPE ROUGHENING AND SCARIFICATION

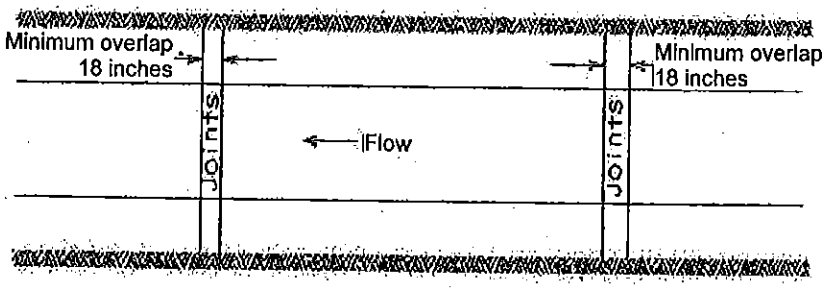
When	• Site grading or construction activities result in grades that may cause increased erosive velocities or off-site sedimentation.
Why	• To reduce runoff velocity, increase infiltration, aid in the establishment of vegetation, reduce erosion.
Where	• On disturbed slopes and stream or drain banks.
Scheduling	• During the growing season.
How	1. Remove vegetation and conduct grading activities. 2. Final grade, add topsoil if necessary. 3. Roughen or scarify slope to create horizontal depressions perpendicular to the slope by running tracking machinery up and down the slope, scarifying the slope or back-blade along a slope contour. 4. Establish vegetation or cover soil to ensure its resistance to soil erosion, sliding, or other earth movement. 5. Remove temporary SESC measures when disturbed areas are stabilized.
Maintenance	• Inspect routinely and following each precipitation event that results in runoff and make repairs until all disturbed areas are stabilized.
Limitations	• Roughening and scarification has limited effectiveness on its own, but is used to speed revegetation. • Steep slopes and accessibility limit ability to use heavy equipment to roughen soil.


Undisturbed Vegetation
Optional Diversion Ditch
Undisturbed Area
Slope
Dozer treads create grooves perpendicular to slope direction
Slope
Create grooves or track perpendicular to slope direction
Slopes should be scarified to minimize runoff velocities
Irregularities in the soil surface catch rainwater and retain seed, mulch and fertilizer

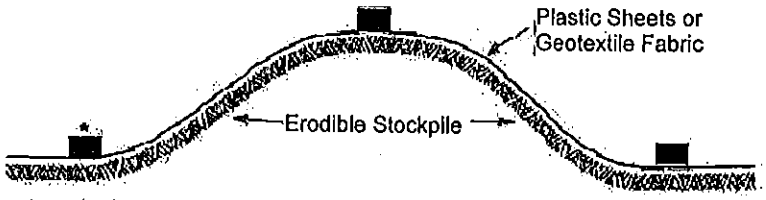
5. Plastic Sheeting or Geotextile Cover

When	• Unstable areas are subject to erosive surface flows or severe wind.
Why	• To provide an immediate temporary protection of unstable areas and slopes from wind or water erosion.
Where	• As a temporary measure to line a channel, cover stockpile areas or to provide immediate cover on exposed slopes.
Scheduling	• Year around.
How	1. Prepare subgrade to design grade and compaction requirements. 2. Remove ruts, roots, soil clods, or other debris from the surface subject to plastic sheeting installation. 3. Consult with erosion control material supplier to select plastic sheeting based on slope gradient, expected surface runoff, and duration of use. Sheeting should be a minimum of 6 mils thick. 4. Position plastic sheets as close as possible to intended use location and unroll perpendicular to anticipated flow direction. 5. Install downstream sheets first, progressing upstream or up gradient overlapping all edges by a minimum of 18 inches. The upstream sheet must overlap the downstream sheet to prevent flow from traveling under the plastic. 6. The most upstream sheet edge must be trenched in a minimum of 18 inches. 7. Secure sheets with staples or pegs of size and length suited to soil conditions immediately after plastic sheeting is installed.
Maintenance	• Inspect routinely to ensure temporary plastic sheets are providing protection. • Maintain SESC measures to prevent soil from eroding onto the plastic sheeting. • Keep vehicular traffic off of plastic to prevent degradation of the plastic.
Limitations	• For temporary use only. • Will fail if water flows beneath the plastic sheeting. • Plastic is prone to damage by wind or high velocities. • Will deteriorate over time.





Plan View



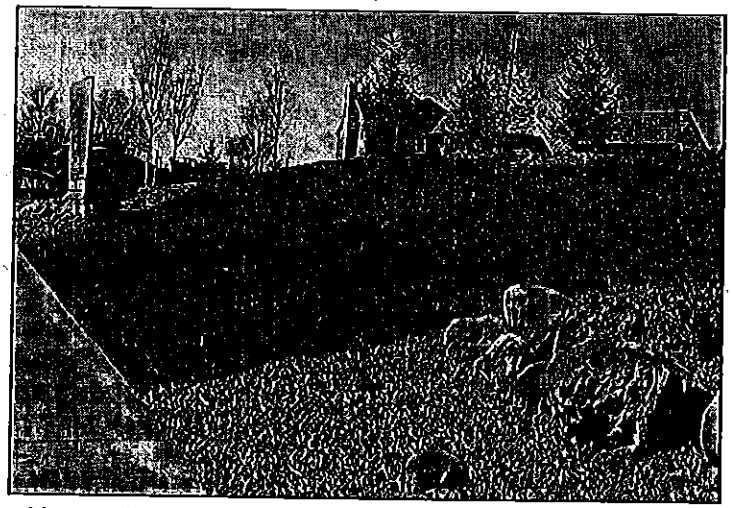
*Plastic Sheets or Geotextile Cover shall be anchored with a non-erodible material.

Source: Michigan Department of Transportation

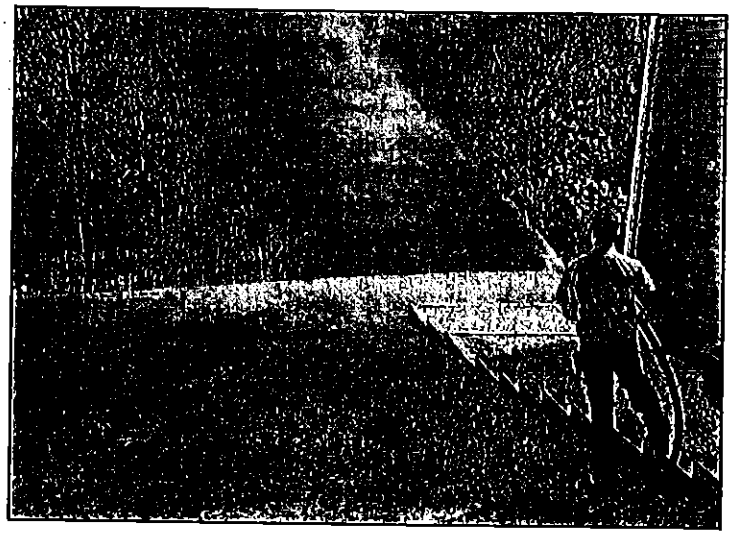
6. SOIL BINDING POLYMERS

When	• Bare soil is exposed to raindrop impact, sheet flow, rill flow or wind.
Why	• When used as a bare-soil spray, it provides a cost effective alternative to reduce soil erosion and increase the infiltration rate in areas that will not be disturbed by foot or vehicular traffic. • When used as the binder for temporary or permanent seeding, it will help control movement of seed, fertilizer, soil and amendments, during both the germination and early plant development stages. It may improve plant establishment and growth rates by increasing infiltration, reducing runoff and holding nutrients in-place for plant use. • When used in conjunction with other appropriate SESC measures, such as erosion control blankets or turf reinforcement mats, or as part of a bonded fiber matrix, polymer binders will help minimize suspended solids in runoff.
Where	• Over all exposed soil surfaces or prepared seed beds prior to erosive force impact.
Scheduling	• Year around under bare ground conditions. The soil cannot be frozen at the time of polymer application; however, the ground can freeze after the polymer has been applied.
How	1. Soil binding polymers must be applied by a knowledgeable applicator. 2. Select polymer based on bench tests which show proper chemical interaction between the subject soil and desired polymer. All polymers must be anionic polyacrylamides or anionic polyacrylamide blends in aqueous [pure] emulsion, granulated or partially hydrated form. 3. If used in granulated form over soil: spread evenly over soil surface at a rate not to exceed 10 lbs/acre. 4. If used in granulated form within compost: mix into compost and spread ½" thick composite so that 20-25 lbs of polymer is used per acre. 5. If used in spray applications, add seed, mulch and other additives first, then add polymer to vigorously agitated water so that mix ratio does not exceed 1 lb polymer for 300 gallons water. Spray soil until the water/polymer sufficiently coats all soil particles without producing runoff.
Maintenance	• Visually inspect all areas where the polymer has been applied without walking or traveling over the area following each significant precipitation or wind event and prior to expected events. Reapply if soil areas indicated disturbance by erosive forces, or if deemed necessary, reapply in conjunction with additional management practices. • Reapply if treated area is disrupted.
Limitations	• Polymer performance is subject to the chemical matching between the subject soil and the polymer, i.e., one polymer will not provide suitable performance for all soil types. • Concentrated flows may create erosive stress beyond the strength associated with polymeric or other spray-applied Management Practices. • When used alone, without seed or mulch, polymers should only be used on slopes 3 horizontal to 1 vertical, or flatter. • Limit use to areas that will not be disturbed by foot or vehicular traffic.

Seed, mulch and spray soil binding polymer applied prior to 1 inch rainfall in October 2001.



Observed in late April 2002 without any required maintenance.

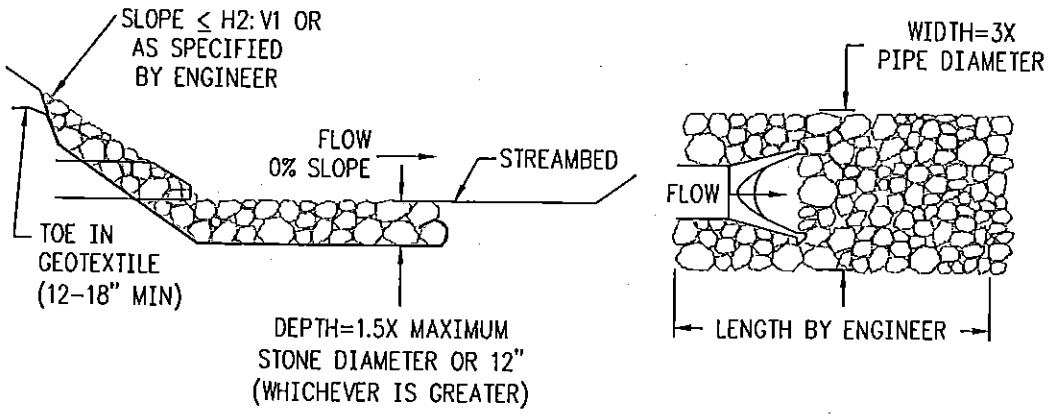


Soil binding polymer and seed being applied with hydroseeding equipment.

Source: Price and Company, Inc.

7. RIPRAP

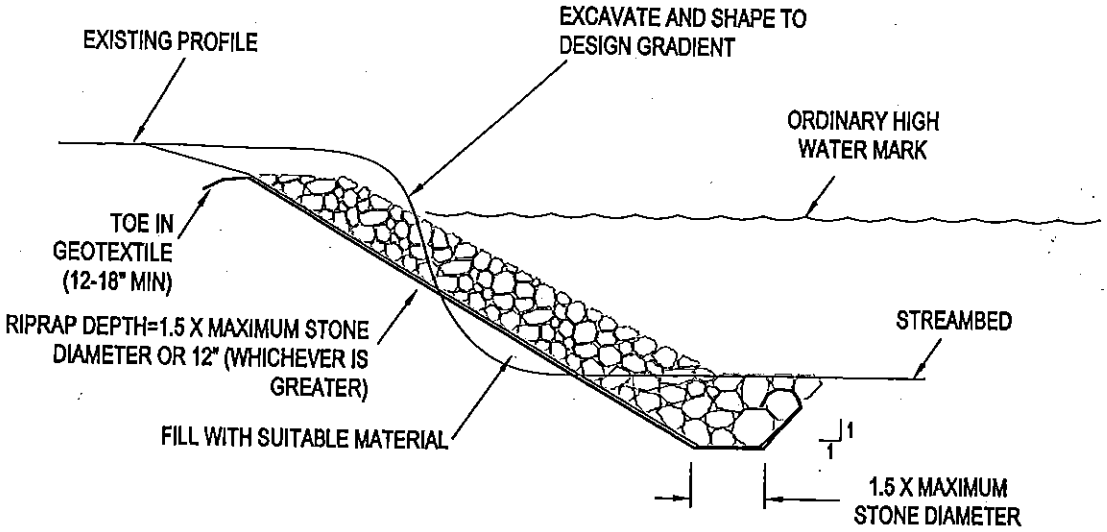
When	• Raw, erodible areas need protection against concentrated flows that have the potential to create scour, down-cutting, or lateral cutting.
Why	• To stabilize and protect stream and drain banks, control channel meander, maintain capacity, protect against wave attack, and reduce sediment load.
Where	• On steep slopes subject to weathering or seepage, for channel liners, inlet and outlet protection at culverts, drain bank protection and to protect shorelines subjected to wave action. • At culvert outlets can be used to protect the stream bed and channel, thus reducing the flow velocity to a level that is non-erosive. • At the outlet of storm drains and as channel linings when flow velocities and concentrations are high and/or the channel slope is steep. • On channel banks where the direction of flow changes and to stabilize erodible slopes.
Scheduling	• During lower flow periods or when emergency repairs are required.
How	1. Riprap must be clean, free of extruding rebar, sized correctly based on anticipated velocities, and placed to the proper thickness. 2. Where high water velocities are anticipated (greater than 6 ft/sec), the Riprap should be designed by an Engineer to ensure that the size of stone is adequate to protect the area from erosion and off-site sedimentation. 3. Over excavate area where riprap will be placed if needed. Riprap should be placed on geotextile fabric to prevent soil from washing out from under the riprap. The edges of the geotextile fabric should be overlapped at least 2 feet. Place riprap immediately after installing geotextile fabric. 4. Install riprap to full thickness in one operation. Do not dump through chutes or use any method that causes segregation of stone sizes. When placing stone, avoid dislodging or damaging underlying geotextile fabric. Tamp individual pieces until firmly bedded. 5. Place smaller, 4 inch to 6 inch stones, in voids to form a dense, uniform and well-graded mass, or as directed by the engineer or representative of the _CDC. Some hand placement may be necessary to obtain an even distribution of stone sizes.
Maintenance	• If riprap has been displaced and the geotextile fabric is damaged during high flow conditions or from vandalism, remove riprap and repair geotextile fabric by adding another layer overlapping the damaged area by 2 feet and anchoring with pins spaced 3 feet apart. Replace riprap over geotextile fabric. • Inspect following each precipitation event that results in runoff and confirm effectiveness, make necessary adjustments. Expand riprap area as needed.
Limitations	• Cost and access. • During winter frozen ground must be excavated and loose fill placed before the geotextile fabric and riprap are placed. • When using large concrete slabs it is difficult to provide adequate support to prevent undermining and failure.



Source: Adapted from State of Michigan, Department of Management and Budget, SESC Guidebook

8. RIPRAP TOE OF SLOPE

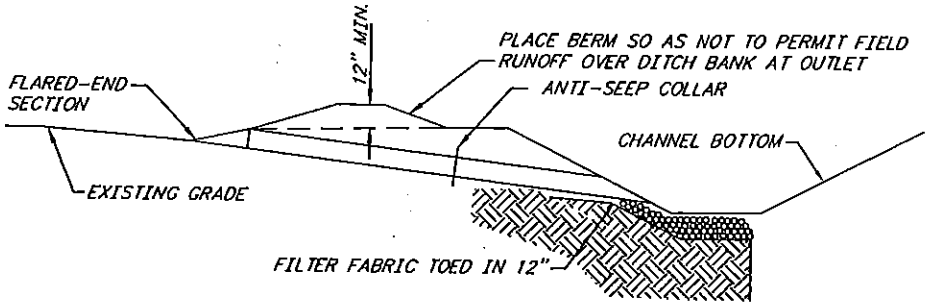
When	• Erosion at the toe of slope is occurring. • On the outside of a channel bend.
Why	• To control further erosion and stabilize and protect drain banks from the erosive force of stream flow.
Where	• In areas with high stream velocities such as: on the outside bend of a drain; at the confluence of two streams or drains or at tile outlets; and on the banks in an area where the drain slope increases and flow velocities are higher. • Modest seepage is causing slumping and slope failure at the toe of slope.
Scheduling	• During lower flow periods or when emergency repairs are required.
How	1. If anticipated high water velocities will exceed 6 feet/second utilize an engineer to properly design the toe of slope riprap protection including the required size of the stone, rock or broken concrete. 2. Install downstream sediment control measures. 3. Isolate work area from flowing water. 4. Clear and grub existing grade. 5. Over excavate streambed and bank beginning at point of proposed stream width where riprap will be placed. 6. Toe in geotextile fabric 12-18 inches below streambed and bank. 7. Cover geotextile fabric with well graded, clean, properly sized stone, rock, or broken concrete. If broken concrete is used, it shall not contain any protruding steel, soil or other fines, asphalt, soluble chemicals, or organic material. 8. Stabilize all disturbed areas. 9. Remove temporary SESC measures after all disturbed areas are stabilized.
Maintenance	• If the riprap has been displaced and geotextile fabric is damaged during high flow conditions or from vandalism, remove riprap and repair geotextile fabric by adding another layer overlapping the damaged area by 2 feet and anchoring with pins spaced 3 feet apart. Replace riprap over geotextile fabric. • Inspect following each precipitation event that results in runoff and confirm effectiveness, make necessary adjustments. Expand riprap area as needed.
Limitations	• Cost and access. • During winter frozen ground must be excavated and loose fill placed before the geotextile fabric and riprap are placed. • Large concrete slabs should not be used because adequate support to prevent undermining and failure is difficult to provide.



Source: Adapted from State of Michigan, Department of Management and Budget, SESC Guidebook

9. OUTFALL STABILIZATION

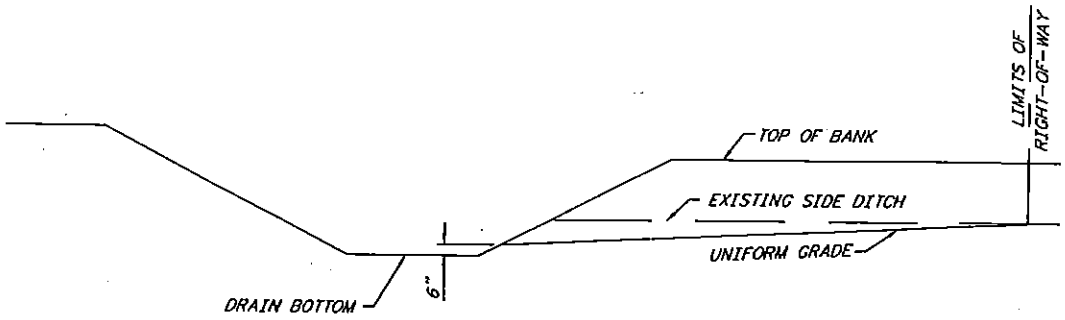
When	• Enclosed drain enters open drain. • Field tile discharges to an open drain. • Outfall area is eroding.
Why	• To prevent erosion at the outlet of an open drain or tile.
Where	• In the stream or drain bank, usually above the ordinary high water mark.
Scheduling	• During lower flow periods or when emergency repairs are required.
How	1. Install downstream sediment control measures. 2. Recess pipe outlet into bank to prevent protruding. 3. Install riprap around and beneath pipe over geotextile fabric. 4. Where possible, direct flow downstream. 5. Install riprap on opposite bank if needed to prevent erosion. 6. Construct a small berm at the top of bank above outfall to prevent gully erosion at trench. 7. Install rodent guard if necessary. 8. Stabilize all disturbed areas. 9. Remove temporary SESC measures after all disturbed areas are stabilized.
Maintenance	• Inspect following each precipitation event that results in runoff for scour beneath the outlet and at opposite bank, and erosion of the trench until area is stabilized.
Limitations	• Cost. • Access. • During winter frozen ground must be excavated and loose fill placed before the geotextile fabric and riprap are placed. • Large concrete slabs should not be used because adequate support to prevent undermining and failure is difficult to provide.



Source: Spicer Group, Inc.

10. SIDE DITCH OUTLET

When	• An open ditch or drain is discharging to a stream or open drain at erosive velocities.
Why	• To prevent erosive velocities at intersection.
Where	• In the incoming ditch or drain, just upgradient from the discharge to a stream or open drain. • A shallow side ditch enters a deeper ditch, drain or stream at a higher elevation.
Scheduling	• During lower flow periods or when emergency repairs are required.
How	1. Install downstream sediment control measures. 2. If a stable grade can be constructed within the drain easement, excavate ditch bottom and side slopes per design specifications, otherwise install an appropriately designed ***armored spillway***, ***sloped pipe spillway***, or ***pipe drop spillway*** within the available right-of-way. 3. Seed disturbed areas with seed and mulch appropriate to site conditions the same day. 4. Add riprap as conditions require. 5. Stabilize all disturbed areas. 6. Remove temporary SESC measures after all disturbed areas are stabilized.
Maintenance	• Inspect routinely and following each precipitation event that results in runoff until stabilized.
Limitations	• Prevents access along ditch bank. • Existing road and drain right-of-ways may limit grading. • Difficult to construct during frozen ground conditions.

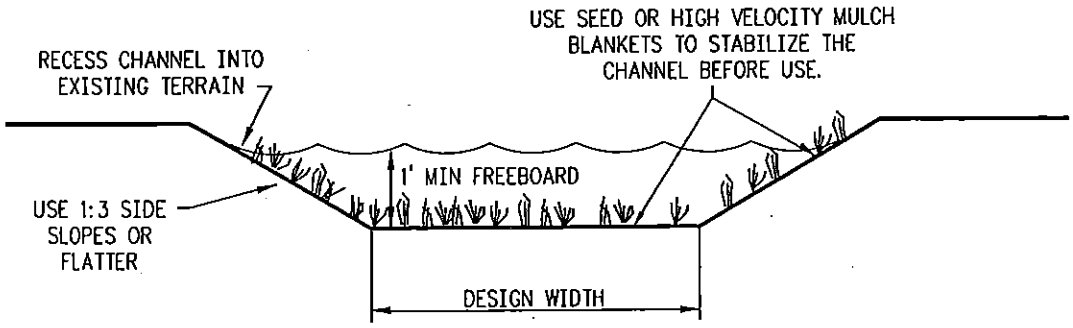


Source: Spicer Group, Inc.

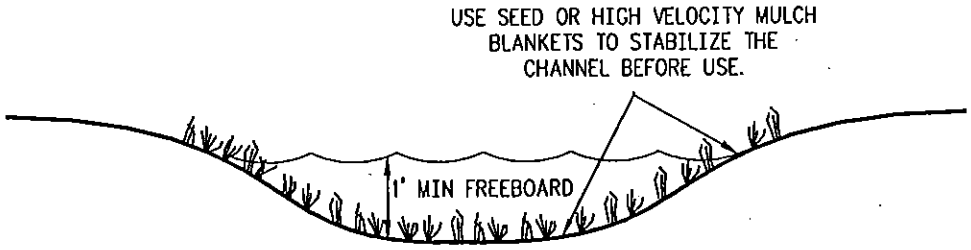
11. GRASSED WATERWAYS

When	• When anticipated flow velocities, either temporary or permanent, have the potential to cause erosion when not protected by vegetation.
Why	• To stabilize the grassed waterway by reducing flow to non erosive velocities and to trap sediment.
Where	• In intermittent streams or drains and constructed ditches and drainage swales where flow velocities and grades do not warrant armoring the waterway or swale with riprap or cobble.
Scheduling	• During the growing season during low flow conditions.
How	1. Identify areas that have the potential for concentrated flow and erosive velocities. Grassed waterways should be capable of conveying a 10-year, 24-hour storm at non erosive velocities. Utilize a qualified professional when designing a channel based on discharge volume, channel slope, flow velocity and soil type. 2. The channel cross section should be wide and shallow with relatively flat side slopes to allow surface water to enter over the vegetated banks without causing erosion and to facilitate maintenance. Trapezoidal or parabolic shapes at least one foot deep are recommended. V-Shaped channels should not be used because the resulting higher flow velocities can create gullies. Sharp bends and steep grades should be avoided. 3. Construct the grassed waterway in stable areas that conform with the natural drainage system or along roadways or property boundaries recessing the swale into the existing grade so that the top of the swale is flush with adjacent grades. Remove and properly dispose of excess soil so that surface water may enter the swale freely. 4. Select vegetation with the appropriate retardance for reducing velocity when required and for the anticipated flow velocities, soil type, depth to water table, climate, and desired vegetative height. The use of native species should be considered. Silt, sand, loam, silty loam, and sandy loam soils are easily erodible with or without vegetation. However, clay loam, silty clay loam, sandy clay loam, silty loam clay soils are erosion resistant, when protected by vegetation. 5. Establish channel vegetation immediately after grading using seed and mulch when needed. Turf reinforced mats, high velocity mulch blankets, pre-vegetated erosion control blankets, or other available products are recommended for ditch grades between 3 and 6 percent and can assist establishment of vegetative ditch bottoms. When installing high velocity mulch blankets unroll in the direction of flow. Extend the blanket to an elevation 1 foot above the anticipated flow depth being careful not to stretch the blanket. 6. Temporary *check dams* may be required to reduce flow velocities on long slopes and in channels that must be used prior to establishment of vegetation.

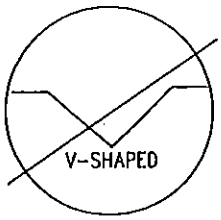
Maintenance	• Inspect periodically and after each rain event until vegetation has been established. Watering may be necessary during dry weather. • If necessary, repair and reseed or replant eroded areas immediately. • Remove accumulated sediment from grassed waterways. • Remove fallen woody debris that may direct flows towards the channel banks.
Limitations	• Channel should not be used until vegetation has been established. • Channel vegetation cannot be established during winter months or when insufficient precipitation is available. • Dormant seedlings have a high failure rate in concentrated flow areas and should be avoided.



TRAPEZOIDAL CHANNEL
CROSS-SECTION



PARABOLIC CHANNEL
CROSS-SECTION

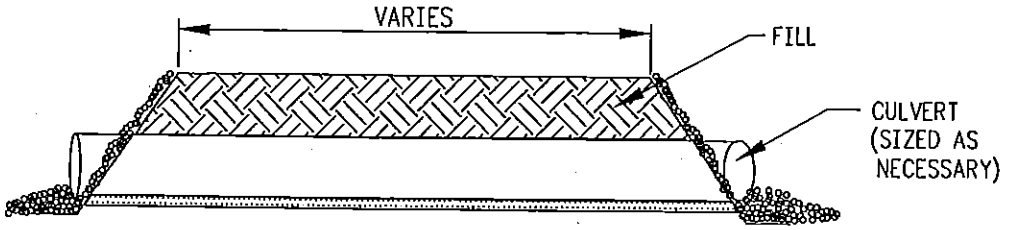


Source: Adapted from State of Michigan, Department of Management and Budget, SESC Guidebook

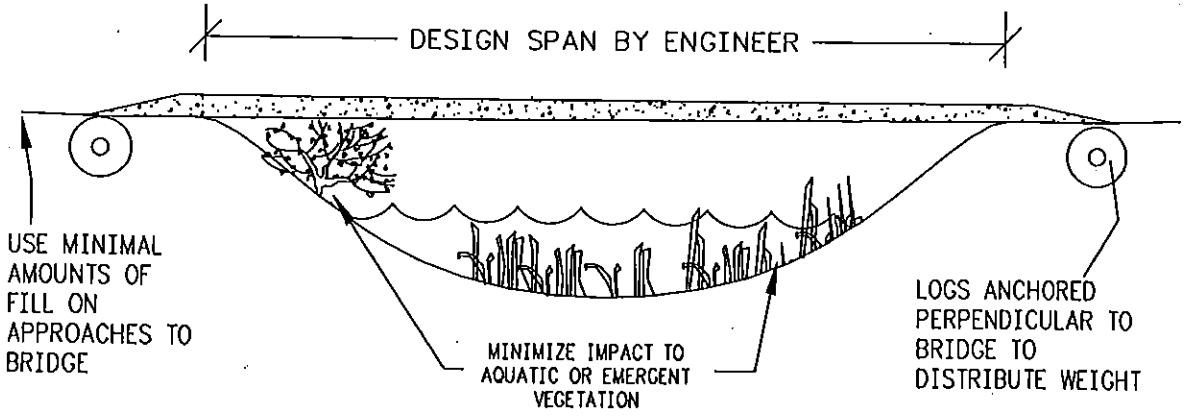
12. TEMPORARY CROSSING

When	• Construction or maintenance equipment requires temporary crossing of a drain to complete activities such as: repairing erosion on the opposite bank; or dredging from the opposite side of the stream to minimize tree removal, maintain shade on the south and west banks minimizing algae growth and maintaining cooler water temperatures for improved water quality. • Erodible and unstable soils, wetlands, crops or residential landscaping needs to be avoided.
Why	• To minimize damage to drain bank vegetation and channel. • No other viable access is available.
Where	• Temporary access is required to the opposite side of a channel. • At locations that will minimize negative environmental impacts and cost.
Scheduling	• Year around during lower flow or frozen ground conditions.
How	• Evaluate the site and identify locations where the temporary crossing will not produce erosive velocities, consult an engineer when needed. • Select one of the following six (6) temporary crossing techniques to minimize the cost and negative environmental impacts. If necessary, install downstream sediment controls before constructing or removing a ford. 1. <u>Ford Drain without Temporary Crossing</u> ♦ Select a location with low banks and stable soils. ♦ Drive equipment across drain, reshape and stabilize drain banks the same day, stabilize all other disturbed areas within 5 days. 2. <u>Native Soil Ford</u> ♦ When ***dredging*** select an upstream location with low banks and stable soils. ♦ Fill channel with native soils sufficient to support equipment. ♦ Drive equipment across drain and excavate fill immediately. ♦ Reshape and seed streambanks the same day and stabilize all other disturbed areas within 5 days. Mulch streambanks if required for stabilization. 3. <u>Timber Ford</u> ♦ Line drain bottom with trees placing them lengthwise parallel with flow until adequate support for equipment is provided. Cross stream with equipment and immediately remove timber to outside edge of drain easement. Reshape and stabilize stream banks the same day, stabilize all other disturbed areas within 5 days. ♦ Crane mats can also be used. 4. <u>Rock Ford</u> ♦ Select a location with low banks and stable soils that will require minimum bank excavation. ♦ Excavate the channel banks as required to provide a shallow road slope adequate for equipment access. Excavate the channel bottom equal to the stone depth required to support the construction equipment. The rock depth typically ranges from 6 to 18 inches. ♦ Stockpile spoils along the back of the drain easement as far away from the stream as possible such that the spoil will not erode back into the drain. Stabilize spoils if they will be left for more than 5 days. If rock ford will remain in place, spread spoils and stabilize within 5 days.

	♦ Install geotextile fabric in the excavated channel bottom to stabilize the foundation in silt, muck or other unstable soils. Place a clean, well-graded weather resistant stone (3 to 6 inch diameter) until the top of the stone matches the stream bottom elevation. Geotextile fabric in a flowing watercourse must be held in place against the stream bottom until sufficient stone is placed to keep the fabric from washing downstream. Hand placement of the stone along the upstream edge may be necessary. ♦ Shape side slopes of entrance and exit ramps to 2 horizontal to 1 vertical or flatter and stabilize. ♦ If rock ford is to be removed use excavated materials to restore natural bank contours and stabilize all disturbed areas. Stone can be left within the stream bottom. 5. Temporary Culvert ♦ Select a location where the drain is narrow and can accommodate a culvert with minimal backfill. The culvert size should be selected depending on the anticipated flow while the culvert crossing is in place. ♦ Line channel bottom and banks with geotextile fabric if needed to provide a stable foundation. Align culvert in center of channel placing culvert bottom at stream bottom elevation. ♦ Backfill with appropriate material and compact around culvert. ♦ Remove fill and culvert. Reshape and seed banks the same day, applying mulch as needed. ♦ Stabilize all other disturbed areas within 5 days. 6. Temporary Bridge ♦ Select a location where the banks are stable and can support a bridge deck preferably with no abutments. ♦ Utilize an engineer or qualified professional for structure design. ♦ Install anchor logs perpendicular to bridge length parallel with banks and anchor bridge deck to logs if necessary for stability and to distribute bridge weight. ♦ Remove Bridge. Reshape and stabilize drain banks the same day, stabilize all other disturbed areas within 5 days.
Maintenance	• If a rock ford or a temporary culvert or bridge will be used for an extended period of time, inspect routinely and following each precipitation event that results in runoff until area is stabilized. Make necessary repairs to maintain soil stability.
Limitations	• High flows make temporary crossings impractical.



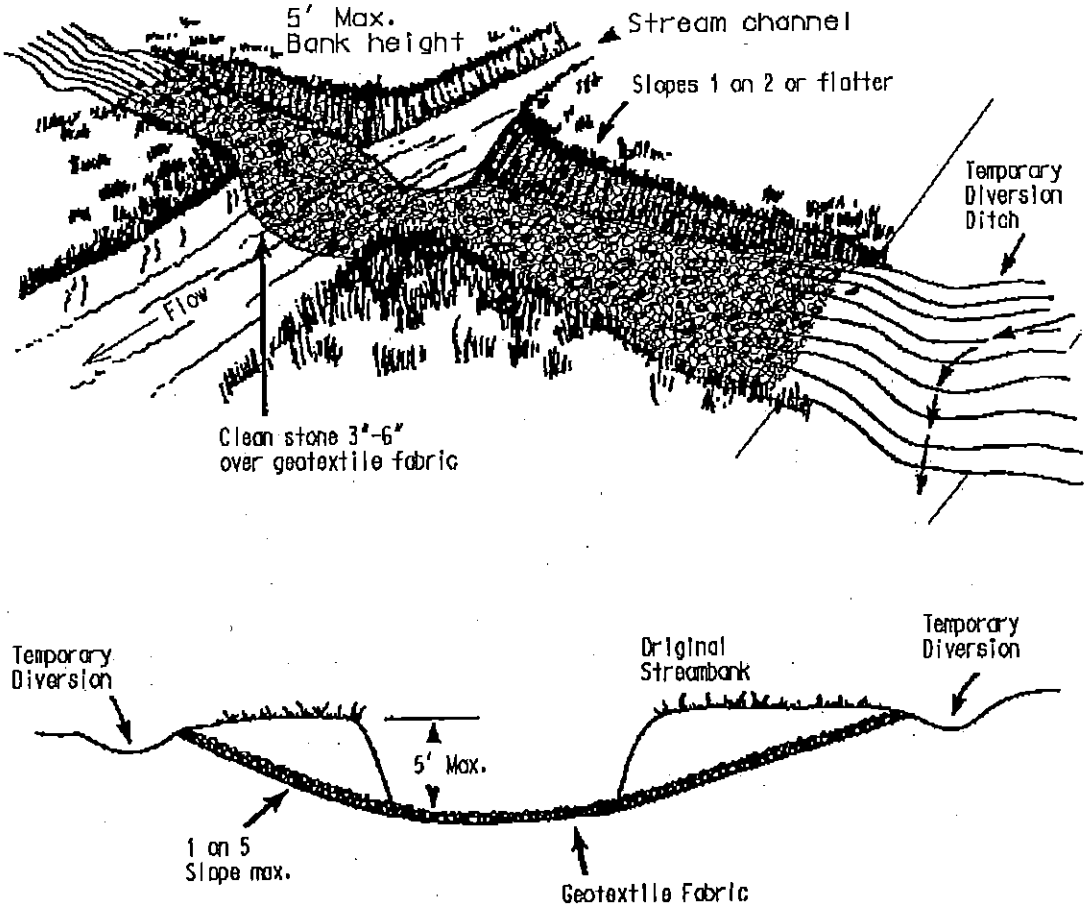
TEMPORARY CROSSING - CULVERT



TEMPORARY CROSSING - BRIDGE

Source: Michigan Department of Transportation

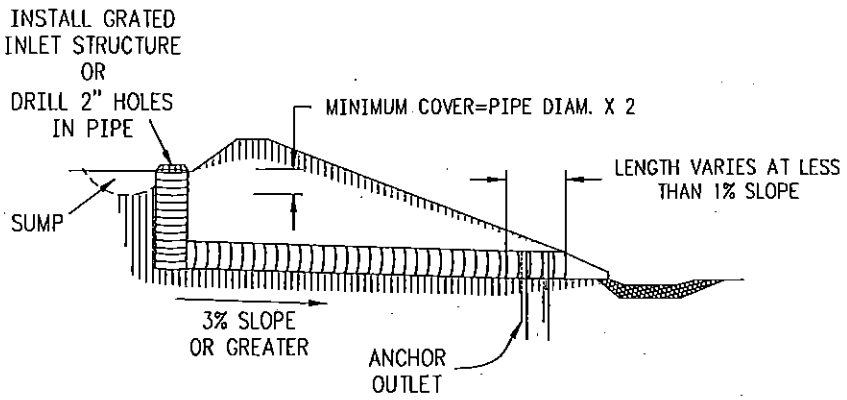
ROCK FORD



Source: Michigan Department of Transportation

13. PIPE DROP SPILLWAY

When	• Concentrated runoff must discharge from a higher to lower elevation within a short horizontal distance, down steep slopes, or when soils are highly erodible or excessively wet.
Why	• To effectively allow runoff to drop in elevation rapidly without causing an erosive condition.
Where	• Within a drain bank.
Scheduling	• During lower flow conditions preferably when vegetation can be established.
How	1. Identify locations of concentrated flow along the top of a slope. 2. Utilize an engineer when designing a pipe drop spillway and a stable pipe outlet that can convey, at a minimum, the 10-year, 24-hour storm discharge and velocity. This includes selection of the appropriate pipe size, the pipe inlet and outlet design, and a stable outlet. Drop pipe inlets with a debris rack or a flared inlet structure with ***sediment sumps*** are preferred inlet alternatives. Install the pipe with a minimum slope of 3 percent. The last 4 feet of pipe should be at a 1 percent slope or less to reduce outlet velocities. (see drawing) 3. Install downstream sediment control measures. 4. Thoroughly compact soil around and under the pipe entrance or inlet structure in multiple lifts and construct ***sediment sumps*** upgradient of the pipe inlet. 5. Install pipe and anti-seep watertight collars along pipe and at pipe joints. 6. Backfill around and over the pipe with a suitable soil and compact in lifts. 7. Construct a compacted earthen berm between the pipe inlet and drain. 8. Toe in geotextile fabric under the pipe outlet extending the fabric to the anticipated extent of the riprap. When riprap extends into moving water the geotextile fabric must be keyed in to a minimum depth of 18 inches below the channel bottom. Isolate work area from channel flow during construction using appropriate measures. 9. Adequately anchor pipe outlet. 10. Provide a stable outfall area and an auxiliary spillway at least 6 feet away from pipe trench over natural ground. 11. Stabilize all disturbed areas. 12. Remove temporary SESC measures after all disturbed areas are stabilized.
Maintenance	• Inspect routinely and following each precipitation event that results in runoff until spillway and surrounding area is stabilized. Inspect the inlet to ensure it is free of undercutting and no water is seeping past the inlet entry and the outlet is adequately anchored. • Once stabilized, inspect periodically to assure pipe inlet, anchor points, and outlet are stable and dissipation devices are functioning properly. Remove debris and accumulated sediment and make any necessary repairs.
Limitations	• More costly than surface or sloped spillways. • Requires bank excavation.

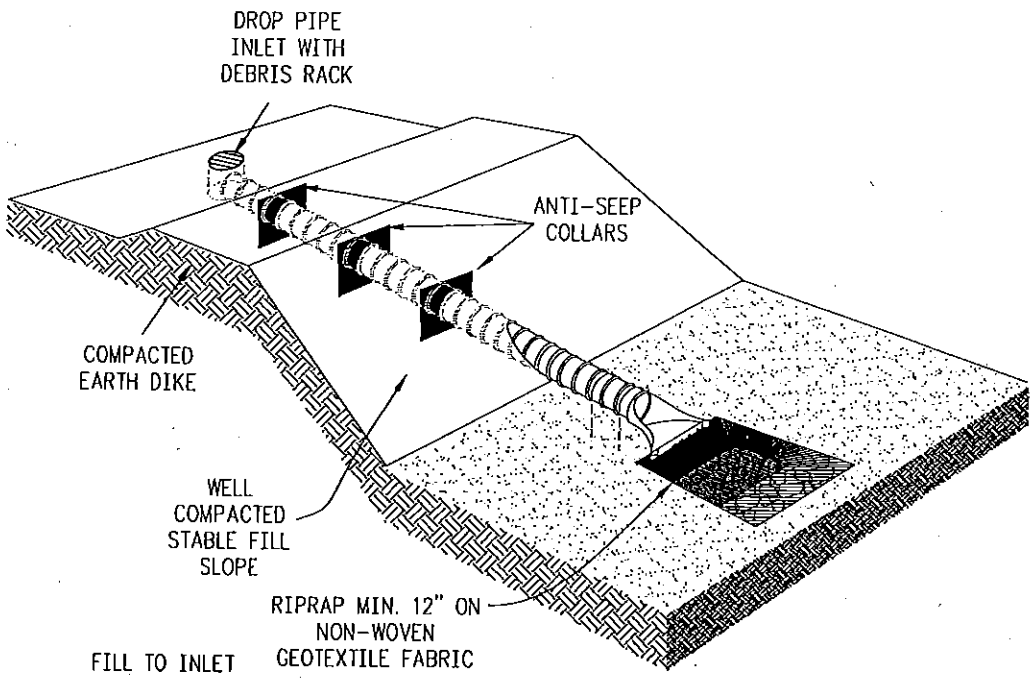


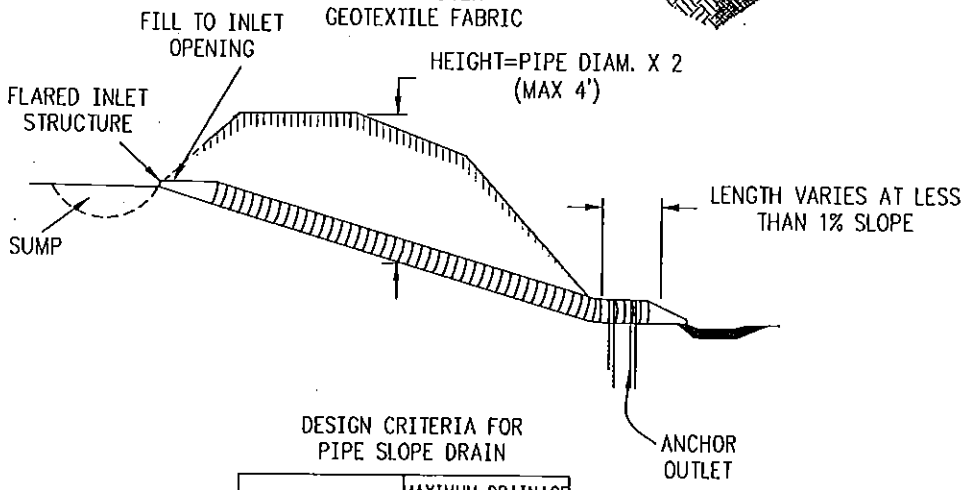
Source: Adapted from State of Michigan, Department of Management and Budget, SESC Guidebook

14. SLOPED PIPE SPILLWAY

When	• When concentrated runoff must be conveyed down a slope from a higher elevation to a lower elevation without causing slope erosion, gullying or slope failure.
Why	• To effectively allow runoff to drop in elevation down a slope without causing an erosive condition.
Where	• Within a drain bank.
Scheduling	• During lower flow conditions preferably when vegetation can be established.
How	1. Identify locations of concentrated flow along the top of a slope. 2. Utilize a qualified professional for the design of a sloped pipe spillway and a stable pipe outlet that can convey, at a minimum, the 10-year, 24-hour storm discharge and velocity. This includes selection of the appropriate pipe size, the pipe inlet and outlet design, and a stable outlet. If the inlet is a standpipe with holes, the holes should be a minimum of 2 inches in diameter and the pipe should extend vertically no more than 6 inches below the top of the dike. 3. Install downstream sediment control measures. 4. Thoroughly compact soil around and under the pipe entrance or inlet structure in multiple lifts. If sediment accumulation is anticipated construct ***sediment sumps*** upgradient of the pipe inlet. 5. Install pipe and anti-seep watertight collars along pipe and at pipe joints. 6. Backfill around and over the pipe with a suitable soil and compact in lifts. 7. Construct a compacted earthen dike between the pipe inlet and the drain and stabilize all disturbed areas. 8. Toe in geotextile fabric under the pipe outlet extending the fabric to the anticipated extent of the riprap. When riprap extends into moving water the geotextile fabric must be keyed in a depth of 18 inches below the channel bottom. Isolate work area from channel flow during construction using appropriate measures 9. Adequately anchor pipe outlet. 10. Provide a stable outfall area and an emergency spillway at least 6 feet away from pipe trench over natural ground. 11. Stabilize all disturbed areas. 12. Remove temporary SESC measures after all disturbed areas are stabilized.
Maintenance	• Inspect routinely and following each precipitation event that results in runoff until spillway and surrounding area are stabilized. Inspect the inlet to ensure it is free of undercutting and no water is seeping past the inlet entry and the outlet is adequately anchored. • Once stabilized, inspect after each significant runoff event to assure pipe inlet, anchor points, and outlet are stable and dissipation devices are functioning properly. Remove debris and accumulated sediment and make any necessary repairs.

Limitations	• More costly than surface spillways. • Requires some bank excavation. • Susceptible to failure if not installed properly. This includes proper soil compaction, installation of pipe and anti-seep collars, and adequately anchoring and stabilizing the pipe outlet including energy dissipation if necessary.





DESIGN CRITERIA FOR
PIPE SLOPE DRAIN

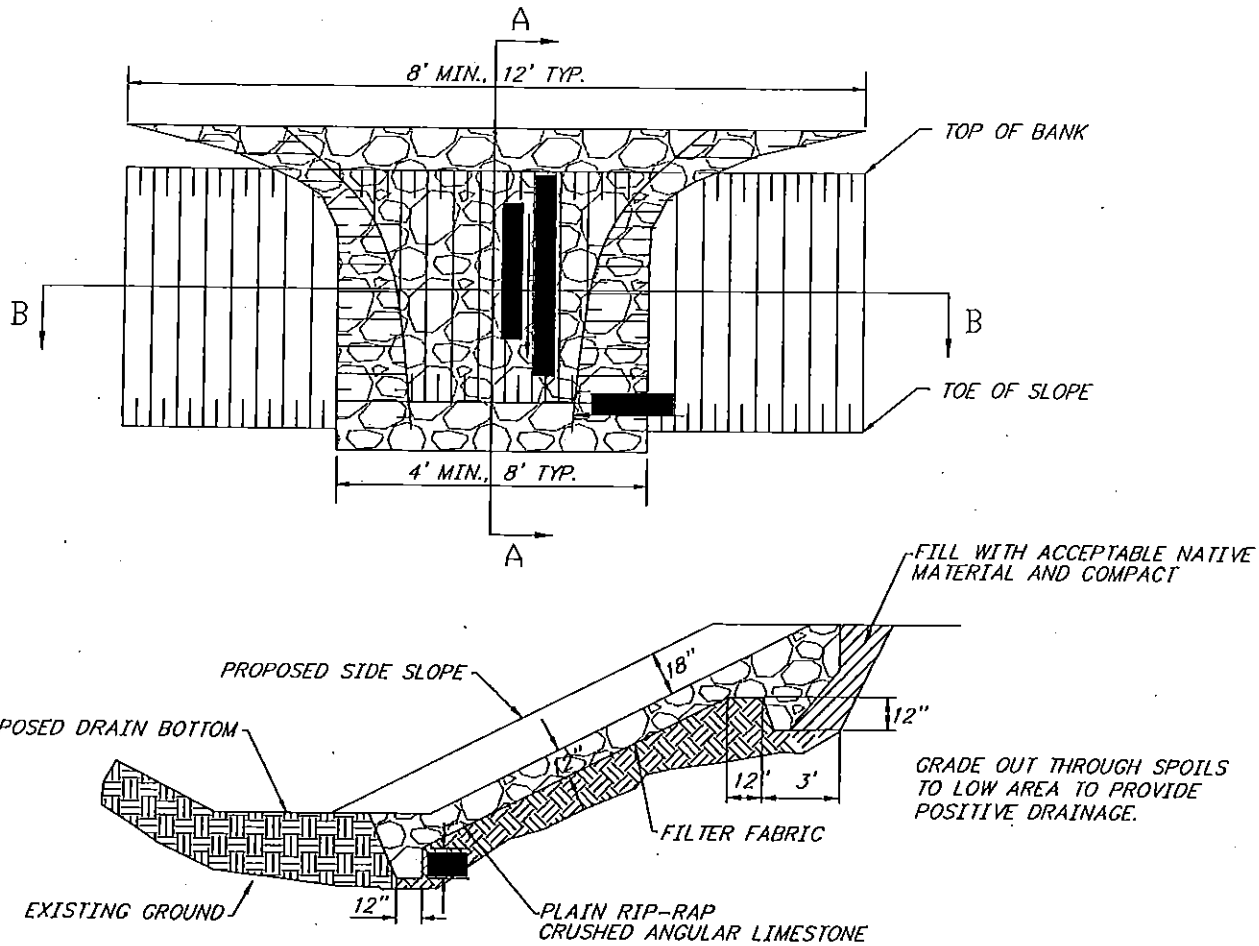
PIPE DIAMETER (IN.)	MAXIMUM DRAINAGE AREA (ACRES)
12	0.5
18	1.5
21	2.5
24	3.5
(2) 24	5.0

SOURCE: MARYLAND DEPT. OF ENVIRONMENT--WATER MANAGEMENT DIVISION

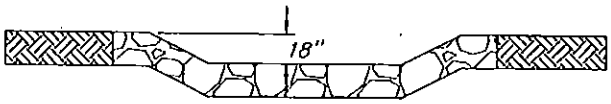
Source: Adapted from State of Michigan, Department of Management and Budget, SESC Guidebook

15. ARMORED SPILLWAY

When	• Concentrated flow must be conveyed down a drain bank or slope.
Why	• To convey concentrated surface runoff down a drain bank or slope without causing gullying, down cutting, slope failure, or channel scour. • Provides an immediate, non-erodible cover. • Prevents channel scour and drain bank erosion.
Where	• At the outlet of enclosed tile drains when flow velocities are erosive. • Slope failure or channel scour is observed or is likely to occur, or when runoff must be redirected around work in the drain.
Scheduling	• During low flow conditions when vegetation can be established.
How	1. Select a location at the top of the slope where runoff can be redirected to a natural drainage swale or a location where a channel can be constructed. 2. Utilize a qualified professional for the design of an armored spillway that can handle, at a minimum, the 10-year, 24-hour storm discharge and velocity. This includes selection of the appropriate riprap size, the spillway width and depth, and an evaluation of the hydraulic jump effects at the toe or hydraulic grade line interface to assure a stable discharge area. Material selected for ***riprap*** should be hard, angular, well graded, and resistant to weathering. 3. Install downstream sediment control measures. 4. The extent of the riprap should always start at least 2 feet above the upper edge of the geotextile fabric and end at a stabilized contour point. 5. Remove all vegetation and woody debris and shape and contour the spillway and discharge area. 6. Place ***riprap*** over geotextile fabric adequately anchoring all sides according to engineering drawing specifications. Add ***riprap*** to a depth of at least 12 inches and 1.5 times the maximum stone diameter, whichever is greater. Larger ***riprap*** should be uniformly distributed first followed by smaller rocks filling in the voids. Slightly overfill riprap material to allow for settling. 7. When ***riprap*** extends into moving water utilize an engineer to assure it is appropriately sized for the channel flow and the geotextile fabric is anchored at to a minimum depth of 18 inches below the channel bottom. Isolate work area from flowing stream during installation with appropriate diversion methods. 8. Stabilize all disturbed areas. 9. Remove temporary SESC measures after all disturbed areas are stabilized.
Maintenance	• Inspect immediately after the first precipitation event that results in runoff and promptly make any needed adjustments or repairs. Inspect routinely thereafter.
Limitations	• The ***riprap*** weight causes it to sink in unstable and mucky soils if it is not placed on geotextile fabric. • Limited to shallower slopes.



CROSS SECTION A-A

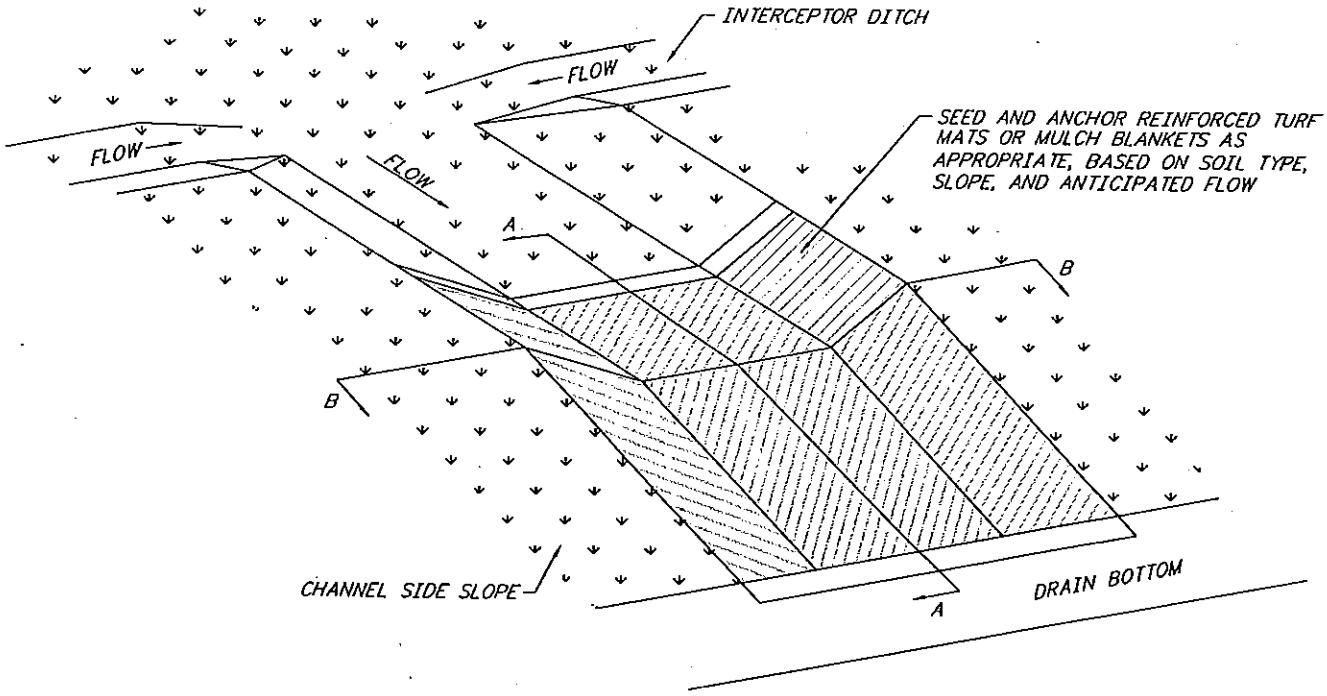


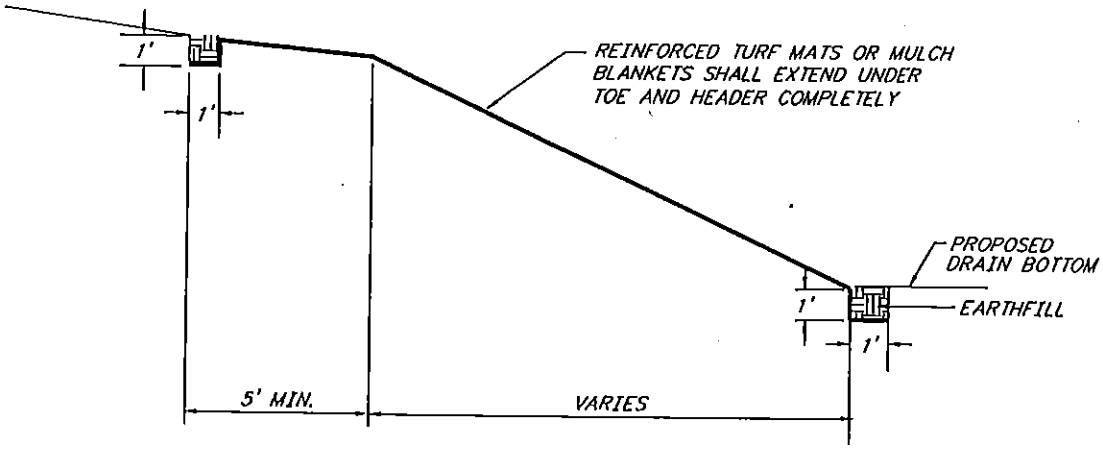
CROSS SECTION B-B

Source: Spicer Group, Inc.

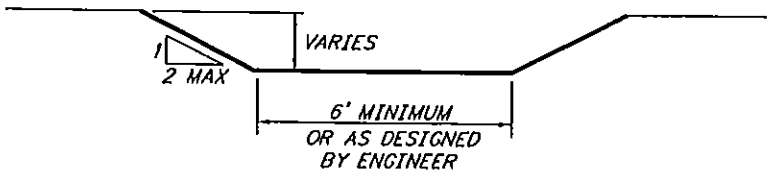
16. REINFORCED VEGETATED SPILLWAY

When	• Concentrated runoff must be conveyed down a gentle drain bank or slope without causing an erosive condition. • A natural appearance is desired.
Why	• To prevent gullying and slope failure.
Where	• When slope failure at eroded outfalls are observed or are likely to occur from concentrated runoff on very shallow slopes where flow velocities will be low enough not to undermine vegetation root structure.
Scheduling	• During low flow conditions when vegetation can be established.
How	1. Construct by shaping and contouring stable low areas that conform to the natural drainage system. The spillway channel cross section should be wide and shallow with relatively flat side slopes. This will allow surface water to enter over the vegetated banks without causing erosion. 2. Excavate and shape the spillway channel. Smooth slopes to facilitate maintenance. Remove and properly dispose of excess soil so that surface water may enter the channel freely. 3. Generally, a vegetated spillway that exceeds a slope of 6 horizontal to 1 vertical must be stabilized with turf reinforced mats, high velocity mulch blankets, pre-vegetated reinforced erosion control blankets, or other available products. Unroll blankets in the direction of flow and do not stretch. The stability is dependent on the ability to establish vegetation, soil type, and the anticipated flow velocity. When a natural appearance is desired and steeper slopes are required, the slope can be armored with lock blocks or plastic waffles, which are filled, compacted, and vegetated. 4. Select the vegetation for the desired appearance, soil type and anticipated soil moisture conditions. 5. Establish vegetation immediately after grading using seed or sod and fertilize, mulch, and water as needed.
Maintenance	• Mow and/or remove woody vegetation as needed to maintain flow capacity. • Inspect periodically. • Repair gullies and reestablish vegetation as needed.
Limitations	• Can only be used on flatter slopes with minimal flow. • Soil type limits vegetation selection and slope stability. • Unstable until vegetation is established therefore *timing and scheduling* is critical. • Must be constructed without sharp bends or steep grades.





CROSS-SECTION A-A



CROSS-SECTION B-B

Source: Spicer Group, Inc.

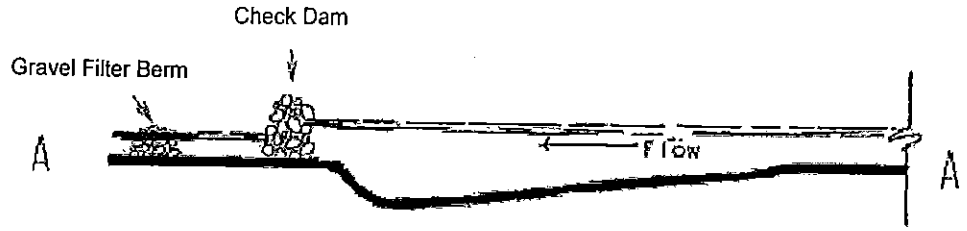
17. TOE DRAIN

When	• When a bank is eroding due to seepage and piping.
Why	• To intercept groundwater and prevent further piping and erosion.
Where	• Where piping is causing erosion.
Scheduling	• During low flow periods.
How	1. Identify groundwater seepage areas that are experiencing piping. 2. Dig a trench within the drain easement away from the drain bank to a depth below the existing groundwater elevation, or deeper if specified by the engineer. 3. Line trench with geotextile fabric. 4. Add pea stone to bottom of trench. 5. Install perforated pipe in the trench on top of the pea stone layer. 6. Cover pipe with pea stone and wrap geotextile fabric over pea stone. 7. Stabilize the perforated interceptor pipe outlet with ***riprap***. 8. Fill trench with excavated soil or sand. 9. Reshape bank and stabilize all disturbed areas.
Maintenance	• Inspect seepage area routinely and following each precipitation event that results in runoff until disturbed areas are stabilized and seepage control is confirmed.
Limitations	• Cost.

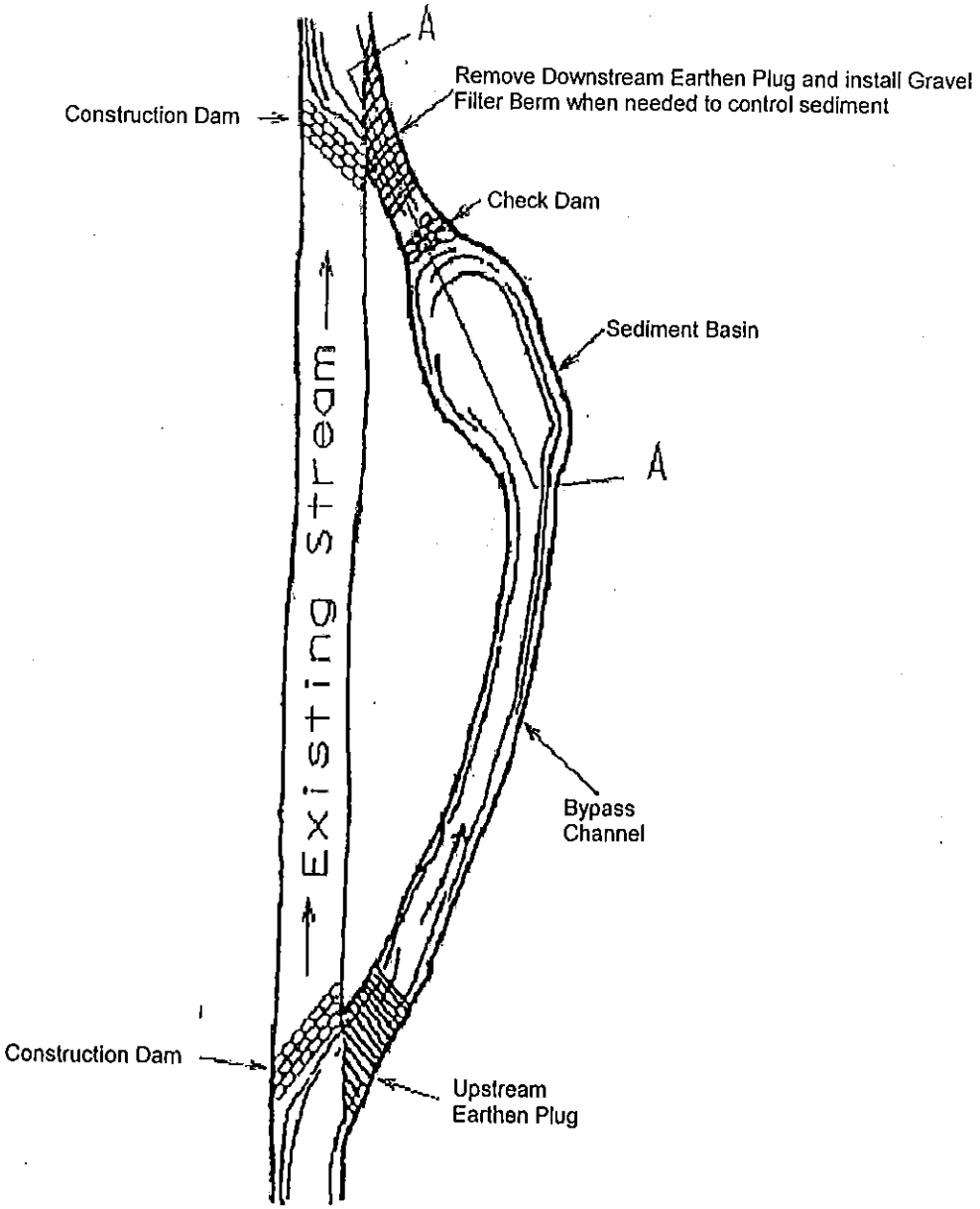
18. TEMPORARY BYPASS CHANNEL

When	• Existing stream or drain must be isolated from existing or potential flow while implementing required activity.
Why	• To minimize downstream sedimentation and provide for an acceptable work site.
Where	• In and adjacent to a stream or drain.
Scheduling	• Preferably during periods of lower flow.
How	1. Design, locate, install and remove a temporary bypass channel with consideration for the topography, soils, and anticipated flow conditions and to minimize environmental disturbances. Utilize an engineer when site specific conditions warrant. Items listed below may vary based on site specific conditions. 2. Select an upland storage area near the site for excavated soil. Stabilize the stockpile and/or install ***silt fence*** around the stockpile area. 3. Install downstream sediment control measures. 4. Excavate a temporary bypass channel leaving earthen plugs at each end until entire bypass channel is graded and stabilized. 5. If site conditions warrant, construct a ***sediment basin*** within the bypass channel just upstream of the downstream limits, leaving sufficient distance between the outlet of the sediment basin and the stream to allow placement of a ***check dam***. 6. Install a ***check dam*** at the downstream limits of the bypass channel. 7. Stabilize excavated stockpile with ***seed*** and ***mulch*** or cover with ***plastic sheets*** if duration of project will exceed 5 days. 8. Stabilize bypass channel by either; toeing in geo-textile fabric and covering with stone to the anticipated high water level, or line the temporary bypass channel with ***plastic sheets***. 9. Remove downstream plug and stabilize channel from the check dam to the stream using geotextile fabric and a sturdy, non-erodible material such as riprap or other stream bed protection. 10. Remove the upstream plug, allowing water to pass through the temporary bypass channel. 11. Place a temporary dam made of erosive resistant material in the upstream end of existing channel to direct flow into temporary bypass channel. Following drainage of existing steam corridor, place a temporary dam in the downstream end of the existing channel to prevent tail water from entering desired work channel. Dewater work area if needed. 12. When construction is complete, and all areas are stabilized, remove the temporary dam from the downstream end of the natural stream followed by the upstream temporary dam. 13. Place an earthen plug at the upstream and then the downstream ends of the temporary bypass channel stabilizing earthen plugs with riprap. 14. Backfill temporary bypass channel, dewatering if necessary. 15. Stabilize all disturbed areas. 16. When necessary, remove temporary downstream sediment and sediment controls after all areas are stabilized.

Maintenance	• Inspect bypass channel, diversion berm and drain channel routinely and following each precipitation event that results in runoff until all areas are restored and stabilized. • Check downstream sediment basin for sediment accumulation. Clean out when ½ full. Place sediment on an upland site and stabilize. • Remove diversion dams when project is complete and disturbed areas have been stabilized. Restore and stabilize temporary channel and remove temporary in stream measures as needed.
Limitations	• Difficulties increase in proportion to size of drain. • May require temporary drain easement on adjacent riparian land. • Costly to implement.

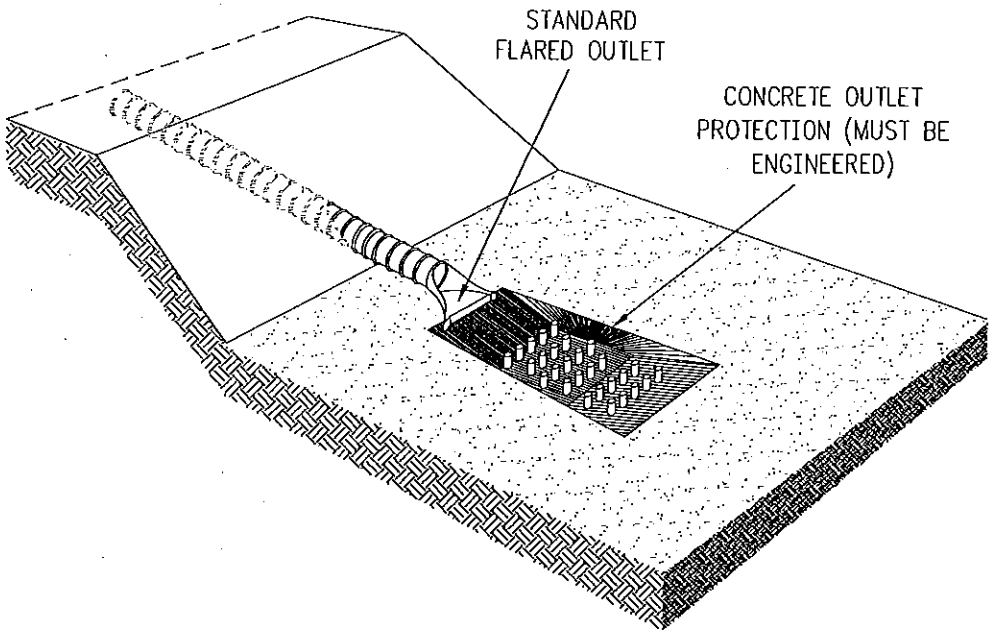


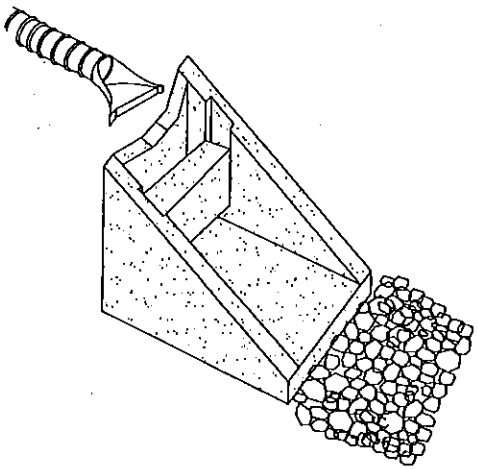
NOTE: Install downstream sediment control measures before commencing earth change activities.



19. ENERGY DISSIPATORS

When	• Discharge velocity of concentrated flow exceeds the erosive velocity of the receiving area or channel.
Why	• To dissipate energy and reduce the discharge velocity of concentrated flow preventing erosion of the receiving area or channel.
Where	• At the outlets of spillways, culverts, drainage pipes, or other conduits when concentrated flow is anticipated to exceed the erosive velocity.
Scheduling	• During low flow conditions or when flow is being diverted around construction area
How	1. Identify discharge points that are causing or are likely to cause scouring of the receiving area or channel. 2. Utilize an engineer for designing energy dissipators based on discharge volumes, flow velocities and soil type. The engineer will determine the anticipated flow velocities and tailwater elevations, size of structural device, method of placement, and extent and design of protection needed by the receiving channel. Deflector buckets, stilling basins, and plunge pools are effective energy dissipating devices used to rapidly reducing flow velocity. A wide variety of pre-constructed energy dissipators are available and should be installed per the manufactures specifications. When flow discharges from the energy dissipation devise into a channel, riprap may be required to prevent erosion and the angle of discharge should be downstream to prevent opposite bank erosion and scouring. 3. Install downstream sediment control measures before commencing earth change activities. 4. Stabilize all disturbed areas. 5. Remove temporary SESC measures after all disturbed areas are stabilized.
Maintenance	• Inspect routinely, based on flow conditions, until all disturbed areas are stabilized. • Inspect after major flood events and remove sediment and accumulated debris and confirm dissipation device is functioning as designed, making any needed adjustments.
Limitations	• Cost.





CONCRETE
DISSIPATOR

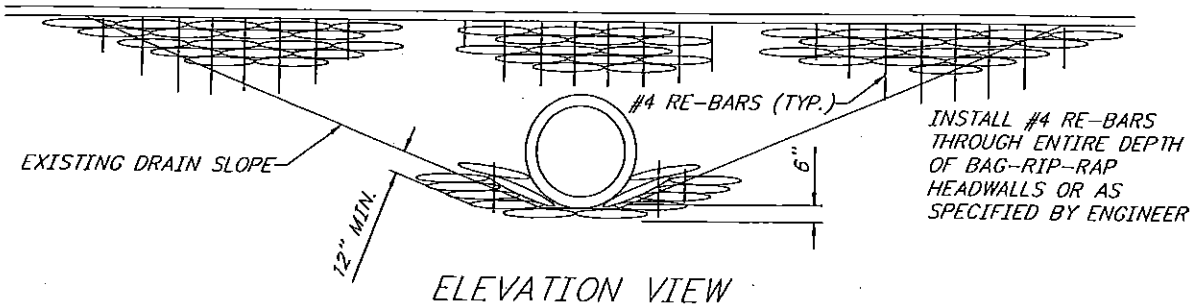
Source: State of Michigan, Department of Management and Budget, SESC Guidebook

20. Concrete Bag Riprap Headwall

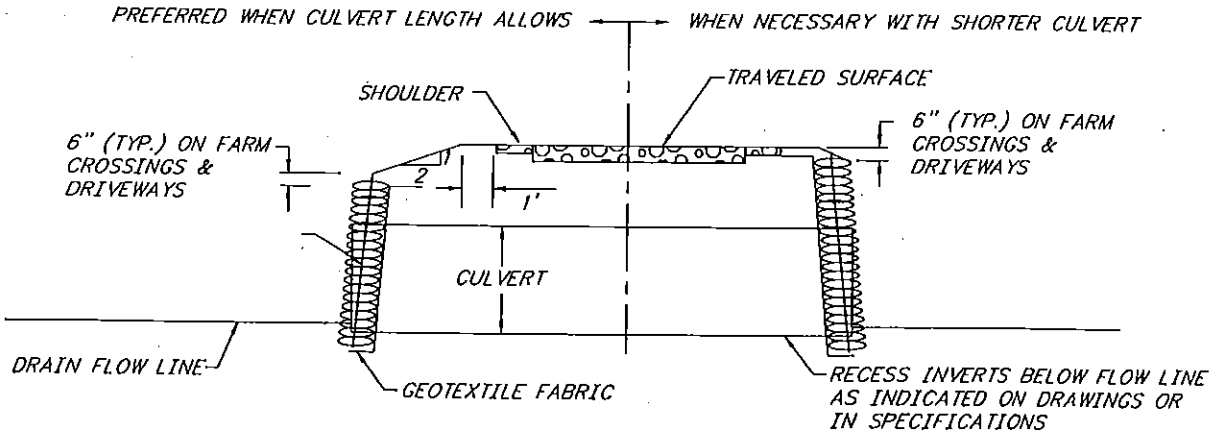
When	• Culvert backfill is eroding. • A longer culvert is impractical.
Why	• To prevent erosion of culvert backfill material and stabilize the crossing.
Where	• At culvert ends as a headwall.
Scheduling	• During low flow periods as part of the crossing installation.
How	1. Utilize an engineer for the crossing and headwall design and installation. Consideration should be given to buoyancy impacts and potential fluctuations between inlet and outlet control. 2. Excavate channel bottom and drain banks on both sides as required to key headwall into banks. 3. Install geotextile fabric behind and under headwall over compacted fill and excavated drain banks. 4. Using wet mix concrete, fill burlap bags 2/3 to 3/4 full. Never use damp or dry mix concrete or woven polyethylene sand bags. 5. Fold over remaining burlap and stack bags beginning the wall beneath the culvert ends. Overlap the bags in each successive row in a brick pattern. 6. Construct wall at a maximum slope of 1 horizontal to 8 vertical leaning the wall towards the culvert mid-span. 7. Drive lengths of rebar through bags per engineer's specifications. 8. A slightly curved wall will be less likely to tip over than a straight one 9. Keep bags wet for 48 hours. 10. A concrete cap on the top of the wall may be required to counteract buoyancy and provide additional stability.
Maintenance	• Monitor periodically headwall for tipping and piping between bags or under wall. Repair as necessary.
Limitations	• Cost. • Labor intensive. • If improperly installed walls have a tendency to tip and fail. • May be a traffic hazard if placed in a road right-of-way. • For culverts on hydraulically steep slopes (slope greater than the slope that would produce critical depth), the control may alternate between inlet control and some downstream point. The fluctuating pressures will cause a pulsating action on the pipe and vibrate the embankment. This pulsating may become so strong that structural damage to the pipe sections, joints and or headwalls may occur.

GEOTEXTILE FABRIC SHALL HAVE AN OVERLAP OF 12" MINIMUM AT JOINTS. REFER TO SPECIFICATIONS FOR PRODUCT & INSTALLATION DETAILS.

BACKFILLING BEHIND GEOTEXTILE FABRIC SHALL BE DONE IN SUCH A MANNER AS TO INSURE THAT NO CAVITIES OR VOIDS REMAIN.



ELEVATION VIEW



TOE-IN FILTER FABRIC A MINIMUM OF 12" AT ALL EDGES.

SLOPE BAG RIP-RAP 1 HOR. TO 8 VERT. TOWARDS ROAD.

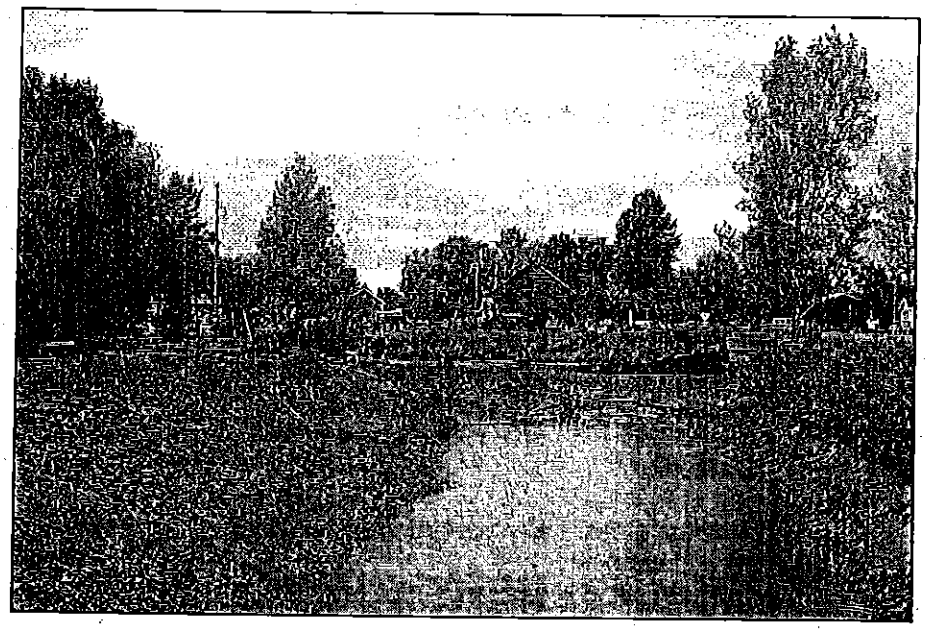
PROFILE VIEW

REMOVE ALL TREES, BRUSH, AND VEGETATION WITHIN THE DITCH BANKS OR WITHIN 8' ABOVE THE DITCH BOTTOM AND WITHIN A 24' WIDE FLOW PATH, WHICHEVER IS GREATER. UNLESS OTHERWISE SPECIFIED IN THE CROSS SECTIONS.

Source Spicer Group, Inc

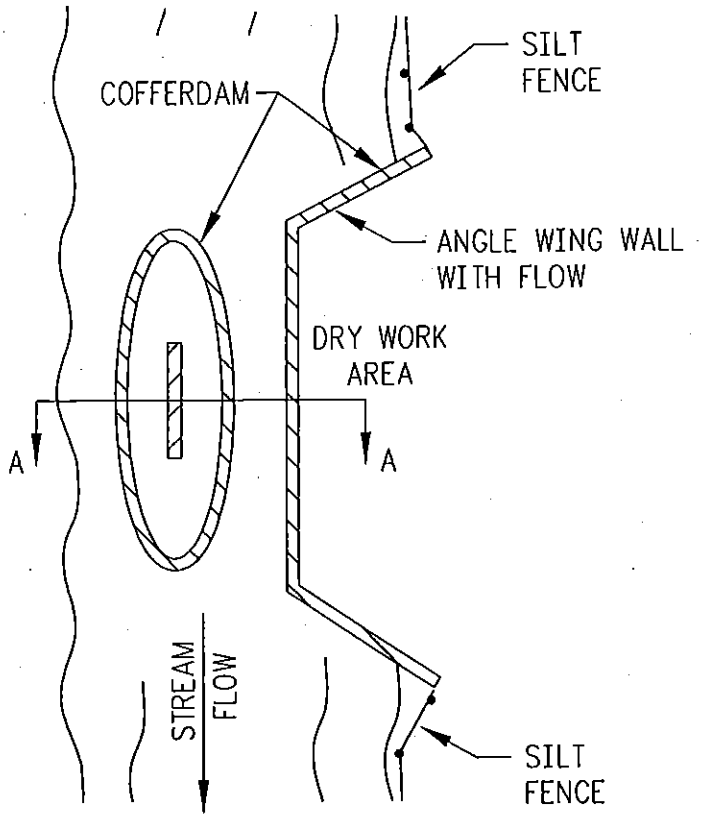
21. SHEET PILING

When	• Hard armor or a retaining wall is required for energy dissipation or slope protection. • As a lake level control structure weir. • As a temporary cofferdam during bridge construction or reconstruction.
Why	• Other less expensive options have failed or will fail under higher flow conditions or from ice damage. • To prevent seepage of contaminants into stream in rare circumstances. • To isolate work area from flowing drain.
Where	• In locations where a vertical bank is required. • Other permanent erosion control measures have failed. • Along or within a flowing drain or a lake.
Scheduling	• Year around.
How	1. Utilize an engineer when designing sheet piling, including the use of tie backs or deadmen. 2. When sheet piling is used as a lake level control structure always utilize an engineer for the structure design. The design must include the spillway elevation and width and the emergency spillway design, if needed. Lake level control structures must be able to pass the 100-year, 24-hour storm without flooding upstream property owners. 3. Install piling with a pile driver to the designed elevation and location. 4. Install tie backs when required to stabilize sheet piling. 5. When sheet pilling is permanent, backfill behind sheet piling, compact fill as necessary, and stabilize disturbed areas. 6. When sheet pilling is temporary, stabilize disturbed areas after installation and restore and stabilize disturbed areas after removal.
Maintenance	• Inspect routinely and following each precipitation event that results in runoff until disturbed areas are stabilized then remove temporary control measures. • Inspect sheet piling annually and repair if needed.
Limitations	• Expensive. • Natural appearance is lost. • Difficult to install during frozen ground conditions.

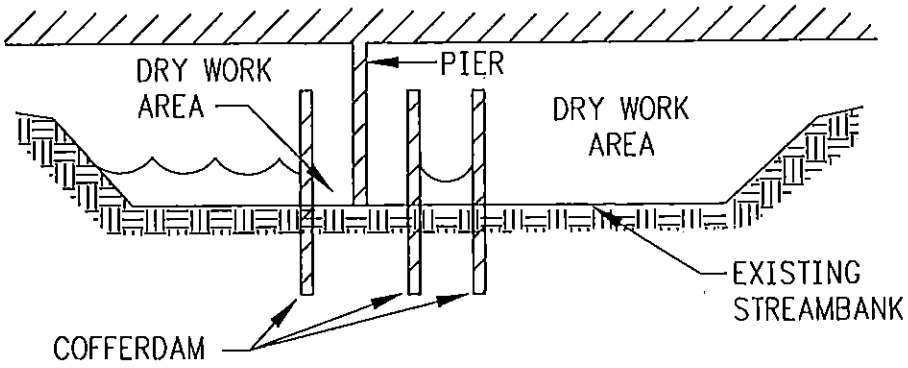


Sheet piling is being used to isolate a drain outlet from the Saginaw Bay during a drain reconstruction project.

Source: Sarah Pistro, Tuscola County Drain Commissioner



PLAN VIEW



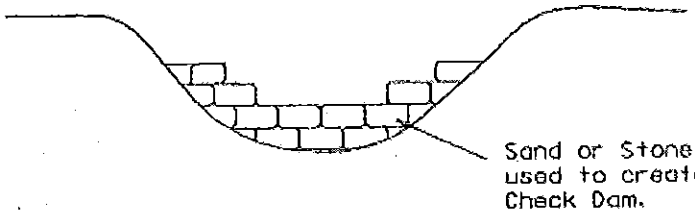
CROSS-SECTION A-A

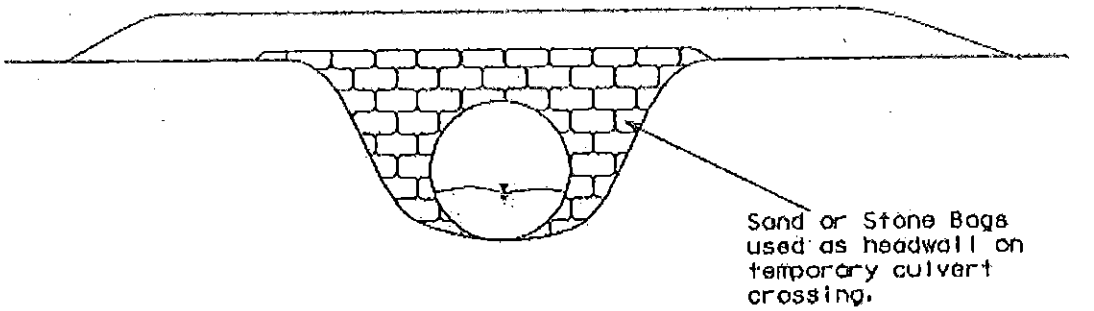
Source: Spicer Group, Inc.

22. Sand or Stone Filled Bags

When	• Temporarily during construction and until all disturbed areas are stabilized.
Why	• To temporarily isolate an earth change activity from flowing water. • To divert water around a construction area. • To impound water temporarily in a stream or drain when flow is minimal and construction activities will be completed in a very short timeframe or when stream flow must be impounded and pumped around or over a crossing during construction.
Where	• Within or adjacent to a stream or drain. • At the ends of a temporary culvert crossing. • On the down gradient side of a construction area.
Scheduling	• Year around.
How	1. Fill burlap or woven polyethylene sand bags 2/3 to 3/4 full and stack in an alternating brick pattern to desired elevation. When used as a temporary check dam follow the ***check dam*** details. When used to impound water that will be pumped around the construction area follow the ***dewatering*** details. When used as a temporary diversion dike follow the ***diversion dike*** details. 2. Complete construction and earth change activities and stabilize disturbed areas. 3. Remove any accumulated sediment from behind the bags prior to removing the sand or stone filled bags.
Maintenance	• Inspect bags daily during construction activities and repair as needed.
Limitations	• Cannot be used as a filtering device because they do not allow for an adequate movement of water through the bags.

Sand or Stone Bag Check Dam



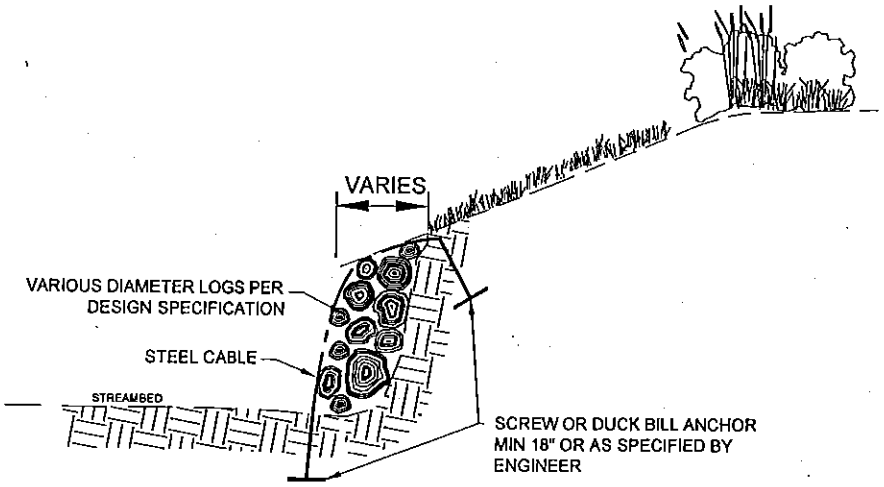


23. TREE REVETMENT

When	• Stream meandering is causing severe undercutting or drain bank erosion.
Why	• To reduce or prevent drain bank erosion by encouraging sediment deposition and deflecting current to midstream. • To prevent a drain from meandering outside the drain easement usually on outside bends where the velocity is higher.
Where	• Within the channel of a stream at the toe of slope where erosion is occurring or where sediment deposition is needed to narrow a stream.
Scheduling	• During lower flow periods.
How	1. Must be designed and installed under the direction of an engineer. 2. Place cut trees or large branches in eroding area or in an upstream location that is selected by an engineer, butt end of log pointing upstream, to divert higher velocity currents towards the center of the channel. Christmas trees may be used to supplement other materials. 3. Cable into the bank with deadhead anchors or cable to adjacent stumps or trees.
Maintenance	• Inspect routinely to ensure trees have remained in place and the drain bank is stabilizing.
Limitations	• If not designed and installed properly flow can be deflected and result in new erosion problems. • Availability of trees locally.

24. LOG REVETMENT

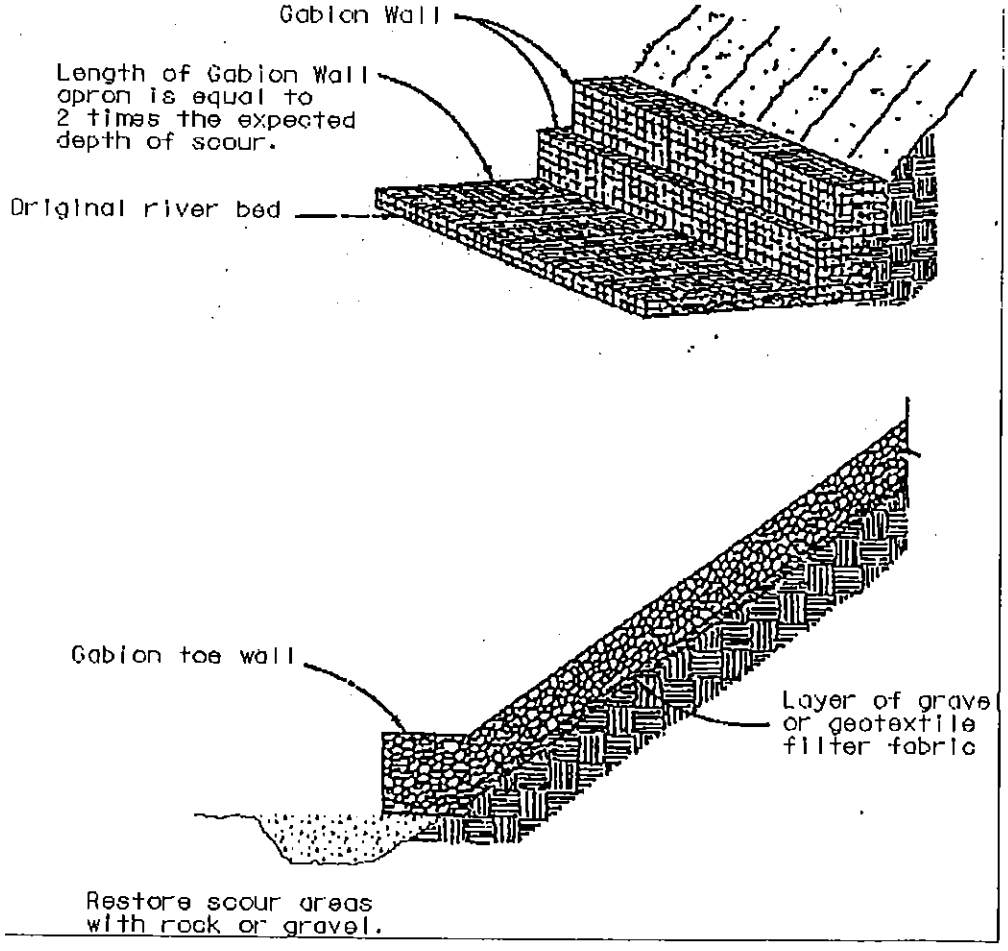
When	• During stream restoration projects to narrow a stream, create ***meanders*** and a stable ***low flow channel.*** • When slumping is occurring to stabilize the drain bank preventing lateral migration and slumping.
Why	• To facilitate deposition to narrow a stream and create meanders. • To reduce drain bank erosion and re-establishment a stable drain bank. • To prevent a drain from meandering outside the drain right-of-way.
Where	• In an area of low energy, at the toe of slope within the stream channel.
Scheduling	• During lower flow periods.
How	1. Must be designed and installed under the direction of an engineer. 2. Install downstream sediment control measures. 3. Prepare streambed and banks for placement of log revetment by removing debris and necessary soil and vegetation. 4. Install anchors approximately 36 inches from the edge of bank to be protected. Anchors are to be placed at 6.0 feet on center. 5. Place logs, 6 to 8 feet in length, at the toe of slope in an overlapping pattern as directed by the engineer and stake in place. Logs should vary in diameter and should be a minimum of 6 inches in diameter. Hardwood logs are preferred where available. 6. Cable hardwood posts to anchors using cable clamps. Tighten cabling to assure that all logs will be held securely in place during high water conditions. 7. Stabilize all disturbed areas. 8. Remove temporary SESC measures after all disturbed areas are stabilized.
Maintenance	• Inspect periodically to ensure logs have remained in place and drain bank has remained stable.
Limitations	• If not designed and installed properly flow can be deflected and result in new erosion problems. • Requires access by heavy equipment



Source: Wetland and Coastal Resources, Inc

25. GABION BASKETS

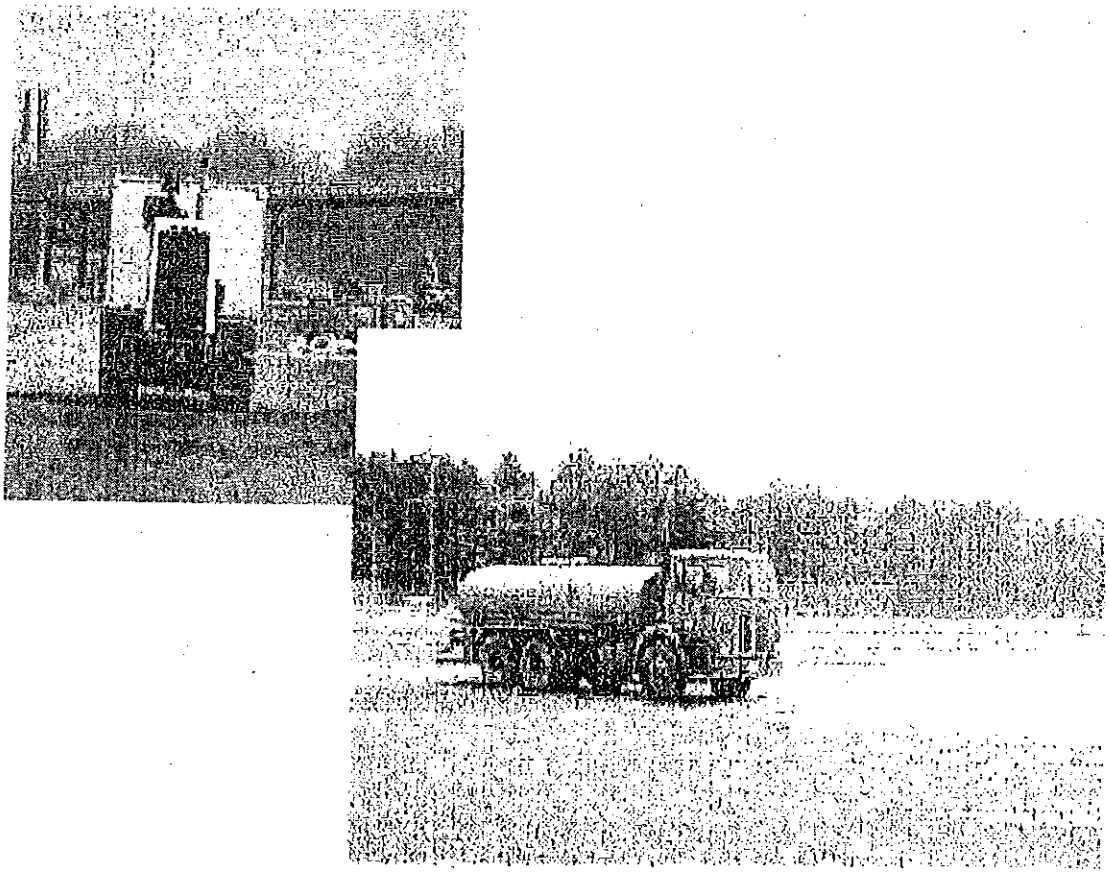
When	• Flow velocities are resulting in major drain bank or slope failure or instability and ***slope and drain bank reshaping*** with or without ***riprap*** is not practical or possible due to inadequate space within the drain easement or adjacent topography is too steep.
Why	• To protect a structure from erosion do to the lateral migration of a stream channel. • To prevent a drain from meandering outside the drain right-of-way.
Where	• At the toe of steep slopes and drain banks within or adjacent to the stream channel.
Scheduling	• During lower flow periods.
How	1. Utilize an engineer for gabion basket design. The wire mesh which makes up the gabion basket should be no smaller than 12 gauge. Mesh size will vary on rock diameter used to fill the basket. Nine gauge wire should be used for all ties and lacing. 2. Install downstream sediment control measures. 3. Excavate drain bank and toe of slope as required removing loose material to provide a stable foundation. 4. Place geotextile fabric on bank to prevent loss of fine grained soils into gabions. Secure fabric ends at least every 8 inches along seams. 5. Place bedding stone on subgrade to provide level and uniform surface for placement of first row of gabions. 6. Assemble baskets prior to placement and begin gabion basket installation at a stable bank point. Place unfilled baskets, attaching adjacent units along top and vertical edges using a minimum of 2 ties between baskets for every square foot of contract area. Each tie should loop around 2 meshes on adjacent baskets. Keep baskets stretched to assure proper filling. 7. Fill each basket with rock, close top and wire to all vertical surfaces of the gabion. 8. When installing more than one row, place assembled empty baskets on top of a completed row, and wire to the front and back of a filled row. 9. Install the number of rows shown on the design plans or to the required finished elevation. 10. Provide loose rock transition zones if necessary, restore scour areas at the base of the wall with riprap, and stabilize all disturbed areas. 11. Remove temporary SESC measures after all disturbed areas are stabilized.
Maintenance	• Inspect gabion basket locations annually following spring or peak flow periods and immediately following extreme flood events, making necessary repairs to prevent undercutting or stream bank failure.
Limitations	• High construction costs. • Gabion walls are not as aesthetically pleasing as vegetated areas. • Subject to vandalism, this can lead to loss of structural integrity.



Source: Michigan Department of Transportation

26. DUST CONTROL

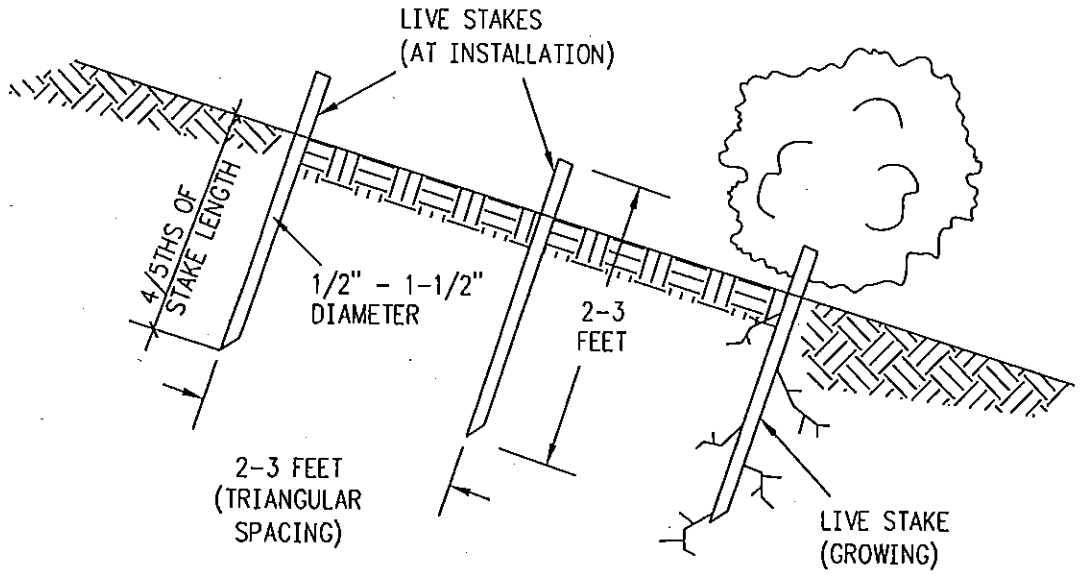
When	• Unprotected areas are being eroded by wind.
Why	• To reduce wind erosion and the resulting off site sedimentation.
Where	• On exposed and unstabilized areas.
Scheduling	• Year around, but most commonly during periods of low precipitation, low humidity and high temperatures.
How	1. Dust control applications can include watering, chemical dust suppressions, gravel or asphalt surfacing, temporary aggregate cover and haul truck covers. Oil should not be used for dust control. 2. Minimize length of time disturbed areas are left unprotected. 3. Quickly stabilize exposed soil by vegetation, mulch, soil erosion control blankets, polymers, sprinkling, or stone layering to minimize areas in need of dust control. 4. Follow manufacturer's instructions regarding application of any dust palliative. Pay particular attention to mixing details. 5. Dust suppressants can be applied using a pressure hose attached to a distributor truck. 6. Limit vehicular traffic on unprotected areas to 15 miles per hour.
Maintenance	• Frequent, even daily application may be required to increase effectiveness. • Do not over water, as over watering may cause erosion.
Limitations	• Some types of dust control may reduce infiltration and result in higher runoff rates increasing the potential for erosion. • Continued effectiveness may require repeated applications.




WATER

27. LIVE STAKING

When	• Slopes or streambanks are eroding, unvegetated, or comprised of unstable soils. • Can be used for staking down surface erosion control materials.
Why	• To promote the re-establishment of a stable slope or streambank and potentially enhance fish and wildlife habitat. • Easy to install, inexpensive method to inhibit soil movement, preserve natural drainage, and to allow native vegetation to stabilize slope. • Enhances conditions for natural colonization of plant species from adjacent areas creating enhanced wildlife habitat.
Where	• In areas requiring slope and bank protection against surface erosion and shallow mass wasting. • In wetland buffers or reservoir drawdown areas where plants may be submerged for extended periods or subject to fluctuating water levels. • In areas requiring stabilization but with limited access for equipment or when little site disturbance is required.
Scheduling	• During early spring and during the early growing season.
How	1. Identify local source of native plant species suitable for collection, based on consideration of purpose, potential hydraulic limitations, climate, soil type, and moisture regime. Obtain approval for material collection. 2. Conduct ***slope and drain bank reshaping*** as required. 3. Add topsoil if required, seed. Installation of mulch or an erosion control blanket such as straw coconut fiber mats may be necessary to stabilize live staking area. Stabilize all other disturbed areas. 4. Collect and prepare ½ to 1-½ inch diameter cuttings 2 to 3 feet in length from native vegetative community the same day as installation utilizing care to prevent over harvesting or depletion of native site vegetation. Remove side branches while leaving bark intact with buds facing upward, cut top square and bottom angled for easy installation. 5. Install live staking with a dead blow hammer, packing soil firmly around stake. Live staking is usually installed in a triangular pattern with 2 to 4 stakes per square yard and driven to a minimum depth of 2 feet.
Maintenance	• Inspect routinely and following each precipitation event that results in runoff until disturbed areas are stabilized. • Periodic pruning and replanting may be required to maintain healthy and vigorous vegetation.
Limitations	• Hand labor intensive. • Unfamiliar too many contractors. • When vegetation matures the channel flow capacity will be reduced and could result in higher flood stages on adjacent and upstream properties. • May require irrigation during vegetation establishment in dry sandy soils.



MICHIGAN SPECIES SUITABLE FOR LIVE STAKING BY SOIL TYPE

SAND

Acer negundo	Box Elder	*Robinia pseudacacia*	Black Locust
Cornus ammomum	Silky Dogwood	*Rubus strigosus*	Red Raspberry
Cornus racemosa	Gray Dogwood	*Salix exigua*	Sandbar Willow
Cornus rugosa	Round-leaf Dogwood	*Salix spp.*	Willow spp.
Cornus sericea	Red Osier Dogwood	*Sambucus canadensis*	American Elderberry
Physocarpus opulifolius	Common Ninebark	*Spirea alba*	Meadowsweet
Populus deltoides	Eastern Cottonwood	*Viburnum lentago*	Nannyberry Viburnum

LOAM

Acer negundo	Box Elder	*Robinia pseudacacia*	Black Locust
Cornus ammomum	Silky Dogwood	*Rubus strigosus*	Red Raspberry
Cornus racemosa	Gray Dogwood	*Salix exigua*	Sandbar Willow
Cornus sericea	Red Osier Dogwood	*Salix spp.*	Willow spp.
Populus deltoides	Eastern Cottonwood	*Viburnum lentago*	Nannyberry Viburnum
Populus tremuloides	Quaking Aspen		

CLAY

Acer negundo	Box Elder	*Rubus strigosus*	Red Raspberry
Cornus racemosa	Gray Dogwood	*Viburnum dentatum*	Arrowwood Viburnam
Cornus sericea	Red Osier Dogwood	*Viburnum lentago*	Nannyberry Viburnum
Populus deltoides	Eastern Cottonwood		

MUCK

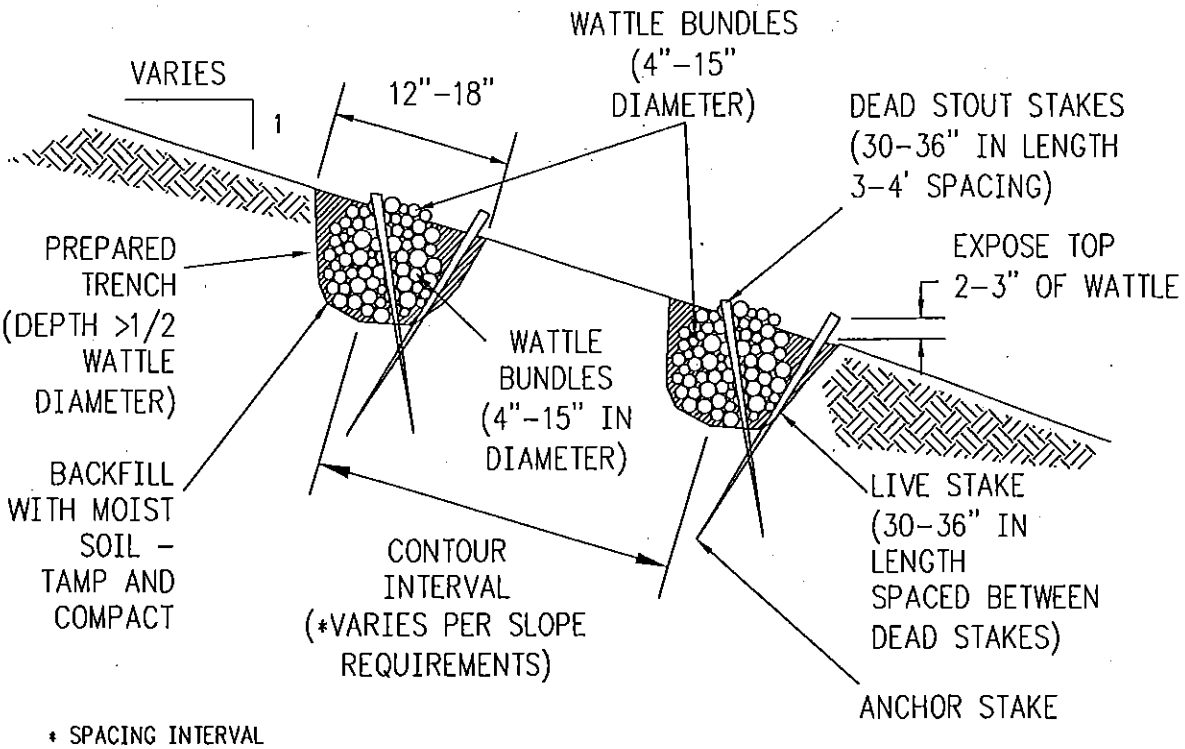
Cornus ammomum	Silky Dogwood	*Sambucus canadensis*	American Elderberry
Cornus sericea	Red Osier Dogwood	*Spirea alba*	Meadowsweet
Physocarpus opulifolius	Common Ninebark		

Source: State of Michigan, Department of Management and Budget, SESC Guidebook

28. WATTLES

When	• Slopes or streambanks are eroding, unvegetated, comprised of unstable soils or are susceptible to gully formation.
Why	• To provide immediate protection of slopes and banks against erosion and gully formation by inhibiting soil movement and gully formation.
Where	• In areas requiring stabilization but with limited access for equipment or when relatively little site disturbance is preferred or required. • On cut and fill slopes and banks requiring stabilization, including dunes, shorelines, or streambanks. • In wetland buffers or reservoir drawdown areas where plants may be submerged for extended periods.
Scheduling	• Collect live plant material while dormant (late fall up to early spring). Install in the early spring during the early growing season.
How	1. Review slope steepness to determine necessary spacing interval (see following table), trench length, and material needs. 2. Identify local source of native plant species suitable for collection, based on consideration of purpose, potential hydraulic limitations, climate, soil type, and moisture regime (refer to ***live staking*** details for suitable species). Obtain approval for material collection. 3. Layout contour interval on slope. 4. Prepare stakes, for use during wattle installation, from 30 to 36 inch long 2x4s by diagonally cutting them on an angle lengthwise on the 4 inch face to make two dead stout stakes. 5. Collect and prepare ½ to 1-½ inch diameter cuttings from native vegetative utilizing care to prevent over harvesting or depletion of native site vegetation. Remove side branches while leaving bark intact. 6. Transport live material to installation site and assemble wattles. Wattles are usually between 5 and 30 feet in length, 4 to 15 inches in diameter, have tapered ends, and are bound with twine every 12 to 15 inches. 7. Starting at the slope base, hand dig trench 12-18 inches wide along a level contour, deep enough to accommodate at least half of the wattle diameter. 8. Place wattle in trench and drive dead stout stakes into slope through wattle every 2 to 3 feet along the entire wattle length. 9. Prepare live stakes that are 30 to 36 inches long by removing side branches while leaving bark intact with buds facing upward, cut top square and bottom angled for easy installation. Install live stakes, with dead blow hammer, between dead stakes on down slope side of bundles leaving live stakes protruding 2 to 3 inches above wattles. 10. Backfill trench with moist soil along sides of wattle leaving top 2 to 3 inches of wattle exposed. Compact soil to eliminate air pockets around buried wattles. 11. Move upslope to the next contour interval and repeat preceding steps. 12. Mulch between stakes if required to control erosion. Mulch blankets may be needed on slopes steeper than 2 horizontal to 1 vertical.

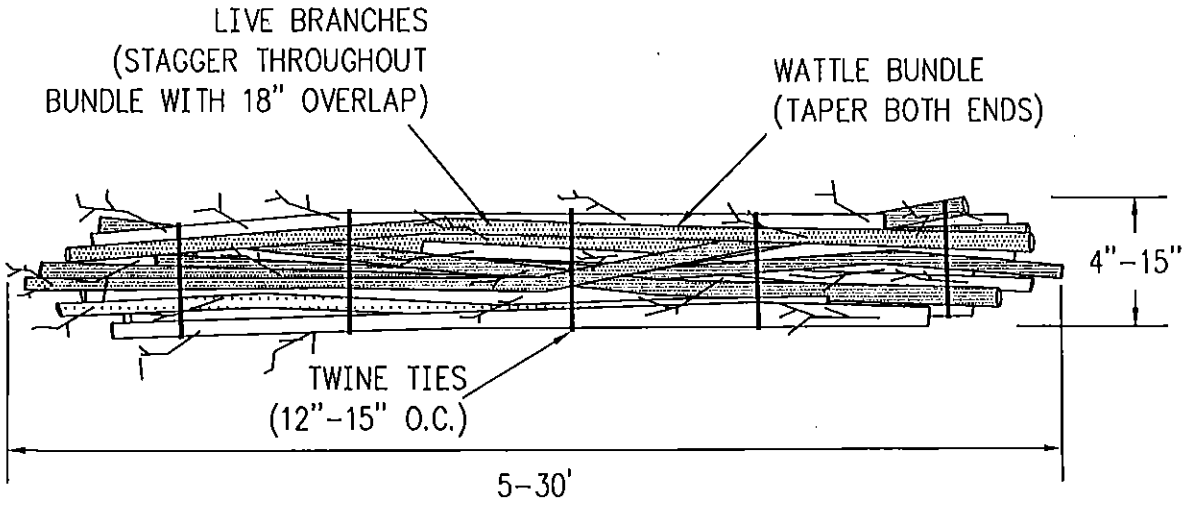
Maintenance	• Inspect routinely and following each precipitation event that results in runoff until vegetative growth has established making needed repairs promptly. • Periodic pruning and replanting of live stakes may be required to maintain healthy and vigorous vegetation.
Limitations	• Labor intensive.



* SPACING INTERVAL

SLOPE	1:1	1:2	1:3	1:4	1:6
CONTOUR INTERVAL	3'	4'	5'	6'	8'

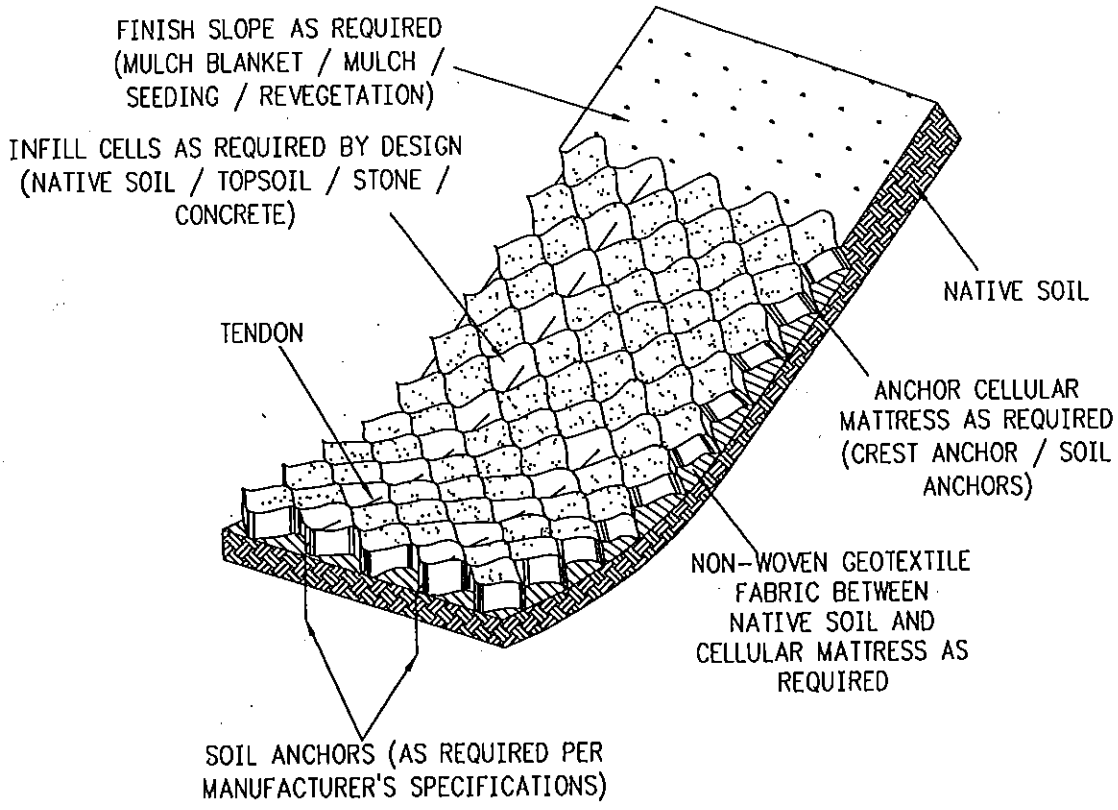
ADAPTED FROM NRCS, SOMERSET, NJ



Source: State of Michigan, Department of Management and Budget, SESC Guidebook

29. CELLULAR CONFINEMENT SYSTEMS

When	• Permanent slope or channel protection must be protected from erosive velocities.
Why	• To inhibit soil movement and preserve natural drainage. Allows for use of native fill and revegetation.
Where	• In areas requiring permanent stabilization of steep grades within a narrow area of impact. • In channels with flow velocities that exceed 5 or 6 feet per second. Consider the soil type when determining the controlling flow velocity. • As an alternative to wood, steel, concrete, or block retaining walls, particularly when the availability to support vegetation and maintain drainage is a factor. • In applications where it is necessary to distribute concentrated loads over a wide area.
Scheduling	• During lower flow periods or when emergency repairs are required.
How	1. Utilize a qualified professional for the design of earth retention applications including site specific construction materials, design details, and selection of infill material that is suitable for anticipated hydraulic conditions. 2. Install downstream sediment control measures. 3. Grade and shape slopes per design. 4. Confinement system sections must be anchored as necessary using stakes, tendons, and/or restraint pins as specified in the site specific design details. 5. Install geotextile fabric along all areas with ground contact with ends buried in trenches. 6. Install confinement system referring to product vendor for additional guidelines for specific site installation details. 7. Fill confinement system with suitable material to support vegetation. 8. Establish vegetation within the confinement system as soon as the fill has been placed and stabilize all disturbed areas. 9. Remove temporary SESC measures after all disturbed areas are stabilized.
Maintenance	• Confinement systems should be checked periodically after installation for settling at the base or indications of lateral movement. Individual cells may need additional fill due to consolidation of fill materials. • Slopes should be inspected after each rainfall event that produces runoff and at least monthly during the first year of establishment to identify and address erosion problems as they occur. Complete identified repairs promptly.
Limitations	• Cost limits use to problem areas. • Seed germination may be delayed due to reduced soil temperature.



Source: State of Michigan, Department of Management and Budget, SESC Guidebook

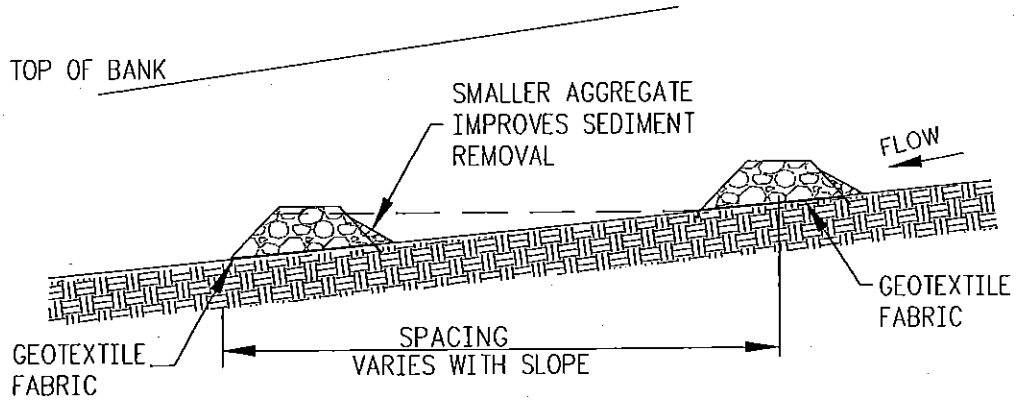
SECTION 4

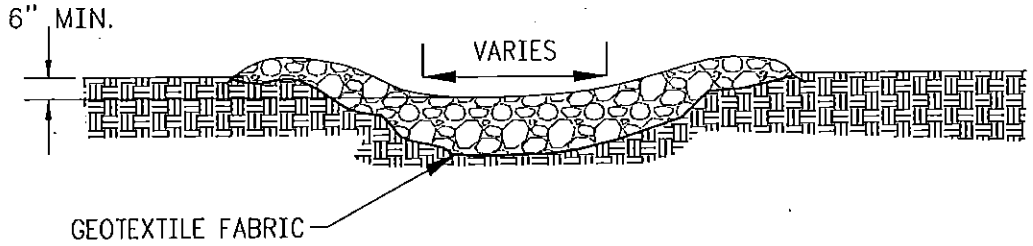
Erosion and Sediment Control Measures

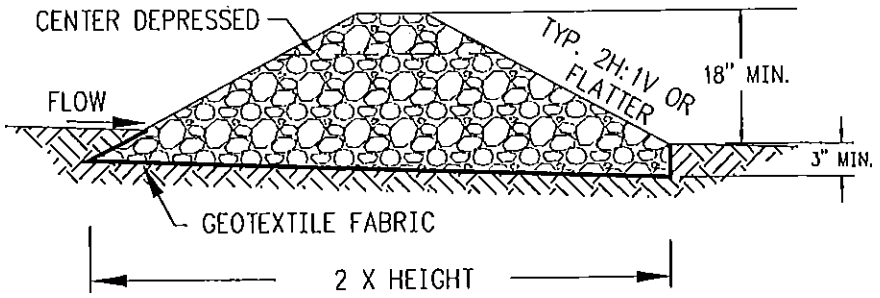
40. CHECK DAM

When	• To stabilize constructed and existing flow corridors when flow is anticipated to exceed the erosive velocity. • To control sediment in a stream in conjunction with a ***sediment sump***.
Why	• To reduce water velocity minimizing erosion in flow corridors and channels. • To temporarily protect vegetation during early stages of growth or permanently to reduce flow velocities.
Where	• Within and across an existing or constructed flow corridor.
Scheduling	• Year around.
How	1. Configure check dams to site specific conditions. Utilize an engineer as necessary to determine the notched center dimensions and spacing between check dams based on channel slope, flow length, discharge, flow velocity, and soil type. Permanent check dams should be designed to pass, at a minimum, a 10-year, 24-hour storm at non-erosive velocity. 2. Permanent check dams should be constructed of clean rock placed on geo-textile fabric which has been toed in a minimum of 3 inches. Ninety percent of the rock should range between 2 to 4 inches for slopes less than 2 percent and 3 to 12 inches for steeper grades. The rock size should be large enough to stay in place during anticipated flows. When larger rock is used, place smaller aggregate immediately upstream to filter sediment and improve efficiency. 3. Temporary check dams that will experience low flow conditions can utilize pea-stone or gravel filled bags instead of rock over geotextile fabric. New commercially available technologies include prefabricated check dams that are effective and sometimes reusable. 4. When not engineered but used in series, the toe of the upstream check dam should be set at the same elevation as lowest point in the top of the downstream check dam. 5. The side slopes of the check dam should be 2 horizontal to 1 vertical or flatter or equivalent to the existing streambank slopes. 6. The middle of the dam should be a minimum of 9 inches lower than the outer edges, allowing flow to go over the depression in the center as opposed to around the sides where it could erode the banks. 7. The outer edges should be keyed into adjacent banks and extend to an elevation above the anticipated flow depth to prevent washouts. 8. ***Sediment sumps*** should be used upstream of check dams when working in sandy soils when excessive amounts of sediment is expected to accumulate. 9. Riprap should be placed immediately below the check dam to help dissipate the energy of the water flowing over the dam. In areas of higher velocities energy dissipation may be needed downstream of the check dam to prevent undercutting. 10. Temporary check dams should be constructed to handle the anticipated flow and sediment load until the site is stabilized. Aggregate filled bags are easier to remove than a rock check dam and the aggregate can usually be spread along the channel bottom when the check dam is removed. Aggregate meeting the gradation requirements of 6A is recommended; use nothing finer than pea-stone.

Maintenance	• Inspect check dams following each runoff event to ensure there is no piping under the structure or around the banks until the flow corridor has been stabilized. • Initiate identified repair needs as soon as possible following inspection. • Remove and properly dispose of sediment when it accumulates to 1/2 the check dam height. Spread sediment in an upland area and seed immediately. • In some instances clogged stone must be cleaned to remain effective. • Inspect downstream structures to ensure they have not been damaged or clogged with displaced rock or stone. • After flow corridor or channel has stabilized remove accumulated sediment from behind the check dam. If check dam is temporary, remove check dam and then stabilize the area.
Limitations	• Check dams greater than two feet in depth at the center may seriously impact the flow characteristics of the flow corridor or channel and should not be used. • Removal of rock check dams is labor intensive and expensive. • Does not remove suspended clay and silt, therefore polymers may be needed.







NOTE: BASE WIDTH SHOULD BE AT LEAST 2X THE HEIGHT

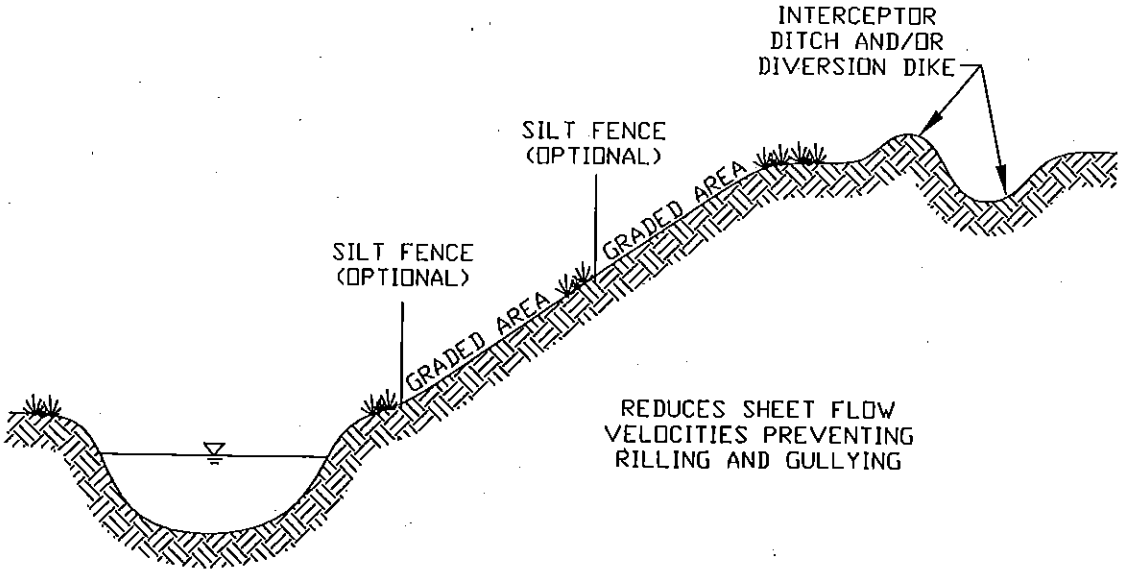
Source: Adapted from State of Michigan, Department of Management and Budget, SESC Guidebook

41. CATCH BASIN

When	• To provide a stable inlet to an enclosed storm drain, open drain or stream.
Why	• On enclosed drains to provide a stable inlet and to collect sediment. • On open drains with steep slopes or erodible soils to prevent erosion of the inlet and to collect sediment.
Where	• Where surface water accumulates and needs an outlet. • Within an enclosed drain system to provide a storm drain inlet and a sump. • Where an open drain discharges to a stream or drain at erosive velocities.
Scheduling	• Year around.
How	1. Excavate to install catch basin with an adequate sump and a positive discharge to the storm system. Design considerations include inlet size, outlet pipe capacity, inlet and outlet elevations, pipe slope, and sump depth. 2. Backfill to grade, adding topsoil and seed, fertilize with a low or no phosphorus fertilizer if necessary. 3. Install soil erosion and sediment control measures to protect inlet.
Maintenance	• Inspect routinely and following each precipitation event that results in runoff until disturbed areas are stabilized. • Remove temporary control measures and clean sediment from sump after site is stabilized. • Routinely remove sediment accumulation by hand or with a vacuum truck and haul to an upland site and stabilize. Contaminated sediments must be disposed of at an approved landfill. • Repair structure as needed.
Limitations	• Disposal cost.

42. VEGETATED BUFFER STRIPS

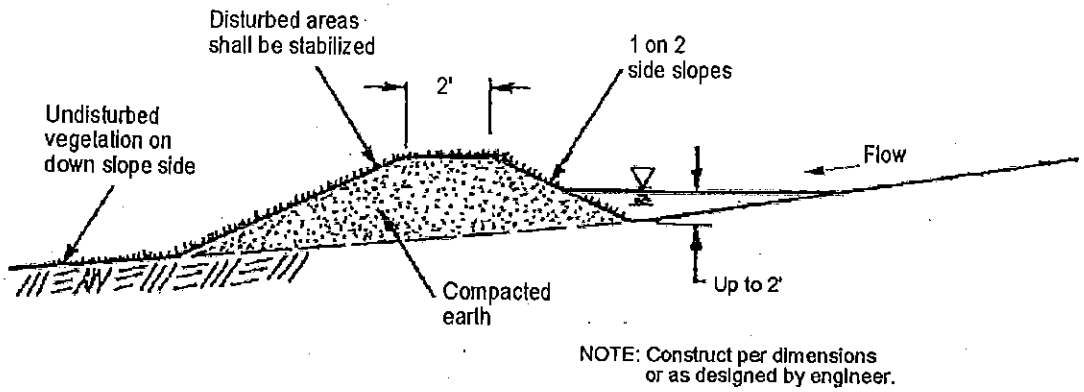
When	• Existing vegetation buffer strip can be maintained during a drain maintenance or improvement project. • A permanent vegetated buffer strip is being established to stabilize an eroding bank or drain easement area.
Why	• Reduces sheet flow velocities preventing rilling and gullying. • Filters sediment laden runoff and reduces the potential for wind erosion. • The vegetation roots hold and stabilize soils. • To protect waterbody from adjacent agriculture and urban development impacts.
Where	• Along stream and drain corridors, sensitive areas, and shorelines.
Scheduling	• Maintain existing buffer strips whenever possible. • Establish new permanent vegetation during the growing season or when dormant ***seeding*** can be used.
How	1. Where possible, maintain or establish at least a 20 foot wide buffer strip . beyond the top of the slope. On steep slopes with highly erodible soils a wider buffer strip is required to attain full benefit of the buffer strip. 2. When reshaping and vegetating a slope, place a ***diversion ditch and dike*** at the top of the slope to prevent water from running over the graded area. 3. Follow the ***seeding, mulching,*** pre-vegetated erosion control blankets or other appropriate SESC measures when establishing temporary or permanent vegetation.
Maintenance	• Reestablish vegetation in disturbed areas. Inspect routinely until disturbed areas are stabilized. • If mowing will be used to prevent establishment of woody vegetation, mow annually no closer than 6 inches ideally between August 1 and August 20 to avoid peak nesting seasons and reduced winter cover for wildlife. • Unwanted competing vegetation should be removed in the first year. Herbicides may be used to eliminate unwanted vegetation and to assist in the establishment of native species. • When burning vegetated buffer strips avoid peak nesting seasons.
Limitations	• Width of drain easements. • Plowing, tilling and construction activities can damage buffer strips. • Property owner's cooperation.



Source: Adapted from Michigan Department of Transportation

43. DIVERSION DIKE

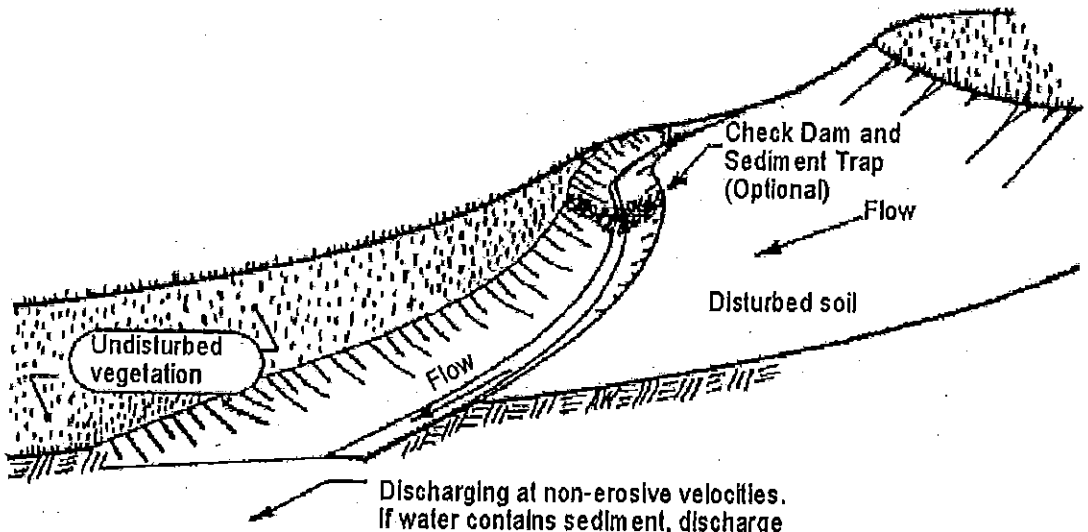
When	• Runoff needs to be diverted around sensitive areas, unstable or easily eroded soils, bare soils, away from steep banks, or around earth change activities.
Why	• Temporarily to divert runoff around earth change activities while vegetation is being established. • To divert runoff to a stable outlet or sediment control device. • To stabilize existing flow corridors and prevent bank blowouts, gullying, and subsurface seepage failures.
Where	• Just beyond top of bank. • Adjacent to in-channel construction area. • On the upgradient side of earth change activities. • Downgradient side of earth change activities to collect sediment laden waters.
Scheduling	• As part of construction activities as necessary. • During an emergency condition.
How	1. Evaluate existing topography and identify flow paths and potential diversion dike and stable outlet locations. 2. Permanent diversion dikes should be designed to divert a 10-year, 24-hour storm. Utilize an engineer when designing a diversion dike based on discharge volume, ditch slope, flow velocity and soil type. 3. Temporary dikes must be constructed with appropriate soils and compacted. 4. Stabilize the diversion dike with vegetation or erosion control blankets prior to use. 5. Provide a stable outlet using SESC control measures such as ***riprap***, ***vegetated spillway***, ***armored spillway***, ***sloped pipe spillway***, or ***pipe drop spillway***. 6. Stabilize all disturbed areas prior to removing diversion dikes that must be removed.
Maintenance	• Inspect routinely and following each precipitation event that results in runoff until stabilized making any necessary repairs until all areas are stabilized.
Limitations	• Must be stabilized prior to use. • May require additional temporary or permanent drain easements.

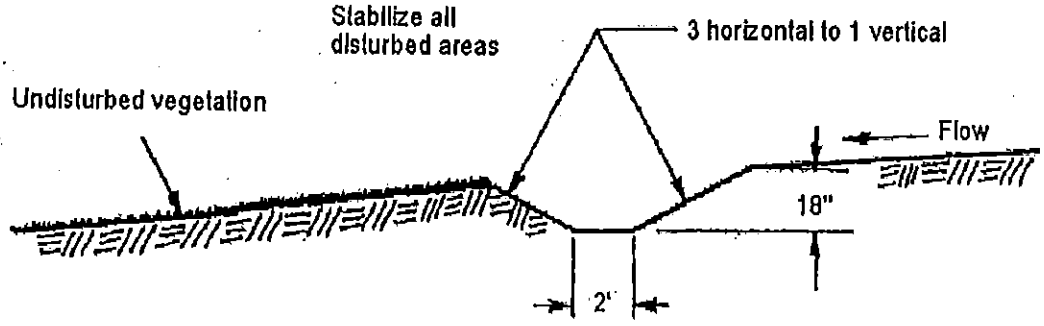


Source: Adapted from Michigan Department of Transportation

44. DIVERSION DITCH

When	• Runoff needs to be intercepted and or diverted around sensitive areas, unstable or easily eroded soils, bare soils, away from steep banks, or around earth change activities.
Why	• Temporarily to divert runoff around earth change activities while vegetation is being established. • To divert runoff to a stable outlet or sediment control device. • To stabilize existing flow corridors and prevent bank blowouts, gullying, and subsurface seepage failures.
Where	• Just beyond top of bank. • Adjacent to in-channel construction area. • On the upgradient side of earth change activities. • Downgradient side of earth change activities to collect sediment laden waters.
Scheduling	• As part of construction activities as necessary. • During an emergency condition.
How	1. Evaluate existing topography and identify flow paths and potential diversion ditch and stable outlet locations. 2. Permanent diversion ditches should be designed to convey a 10-year, 24-hour storm at non erosive velocity. Utilize an engineer when designing a diversion ditch based on discharge volume, ditch slope, flow velocity and soil type. ***Check dams*** may be necessary to reduce runoff velocity within the ditch. 3. Temporary diversion ditches can range from a shallow swale to a deeper constructed ditch. 4. Stabilize the diversion ditch with vegetation or erosion control blankets prior to use. 5. Provide a stable outlet using SESC control measures such as ***riprap***, ***vegetated spillway***, ***armored spillway***, ***sloped pipe spillway***, or ***pipe drop spillway***. 6. Stabilize all disturbed areas prior to restoring diversion ditch areas that must be removed.
Maintenance	• Inspect routinely and following each precipitation event that results in runoff until stabilized. • Routinely remove debris and repair ditch as needed.
Limitations	• Top of bank diversion ditches are limited to small flows and shallow ditch depths not exceeding 3 feet. • Must be stabilized prior to use. • May require additional temporary or permanent drain easements.



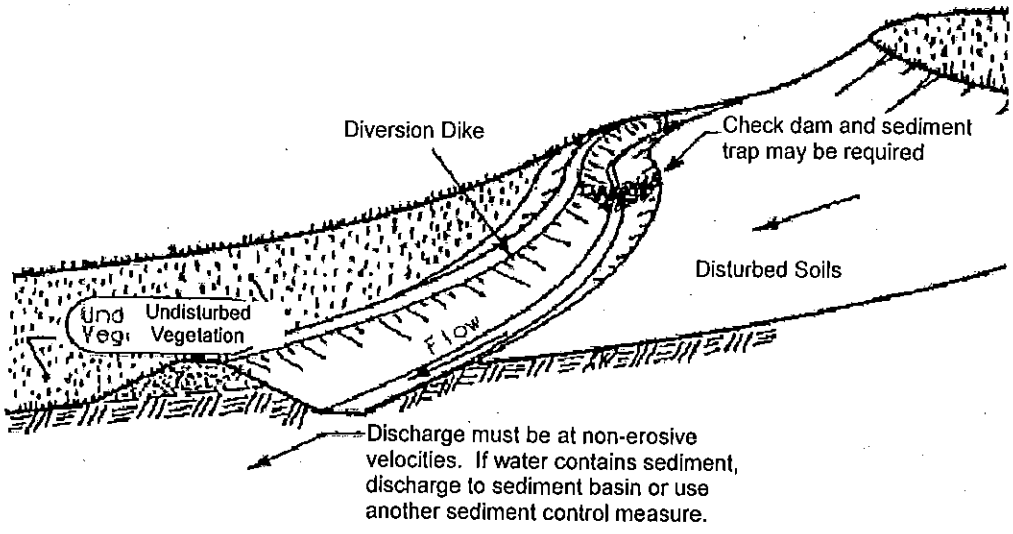


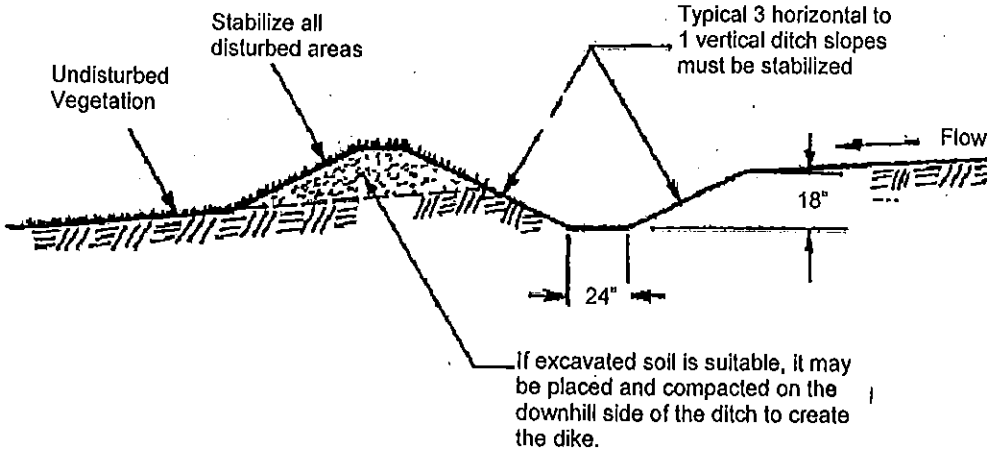
NOTE: Construct per dimensions
or as designed by engineer.

Source: Adapted from Michigan Department of Transportation

45. Diversion Ditch and Dike

When	• Runoff needs to be diverted around sensitive areas, unstable or easily eroded soils, bare soils, away from steep banks, or around earth change activities.
Why	• To divert runoff around earth change activities while vegetation is being established. • To divert runoff to prevent bank blowouts, gullying, and subsurface seepage failures. • To stabilize existing flow corridors.
Where	• Just beyond top of bank. • Adjacent to in-channel construction area. • On the upgradient side of earth change activities. • Downgradient side of earth change activities to collect sediment laden waters.
Scheduling	• As part of construction activities as necessary. • During an emergency condition.
How	1. Evaluate existing topography and identify flow paths and potential diversion ditch and/or dike, and stable outlet locations. 2. Permanent diversion ditches should be designed to convey a 10-year, 24-hour storm at non erosive velocity. Utilize an engineer when designing a diversion ditch and/or dike based on discharge volume, ditch slope, flow velocity and soil type. ***Check dams*** may be necessary to reduce runoff velocity within ditch. 3. Temporary diversion ditches can range from a shallow swale to a deeper constructed ditch. Temporary dikes must be constructed with appropriate soils and compacted. 4. Stabilize the diversion ditch and/or dikes with vegetation or erosion control blankets prior to use. 5. Provide a stable outlet using SESC control measures such as ***riprap, vegetated spillway, armored spillway, sloped pipe spillway,*** or ***pipe drop spillway.*** 6. Stabilize all disturbed areas prior to restoring diversion ditch and dike areas that must be removed.
Maintenance	• Inspect routinely and following each precipitation event that results in runoff until stabilized. • Routinely remove debris and repair ditch and dike as needed.
Limitations	• Top of bank diversions are limited to small flows and shallow ditch depths not exceeding 3 feet. • Must be stabilized prior to use. • May require additional temporary or permanent drain easements.





NOTE: Construct per dimensions or as designed by engineer.

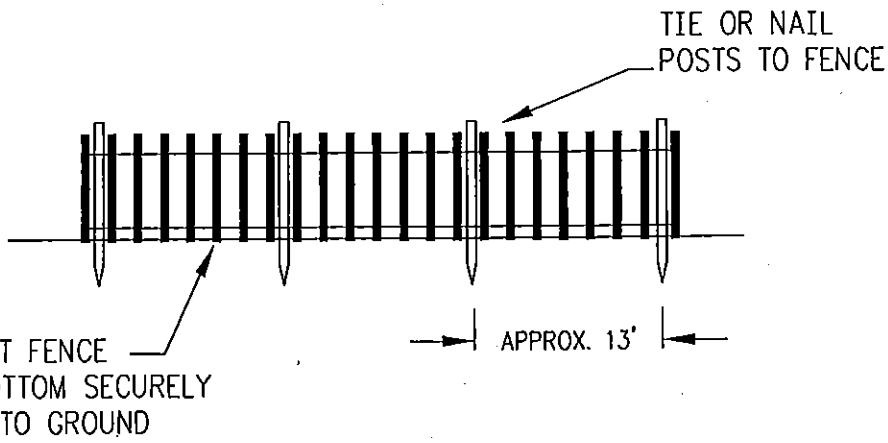
Source: Adapted from Michigan Department of Transportation

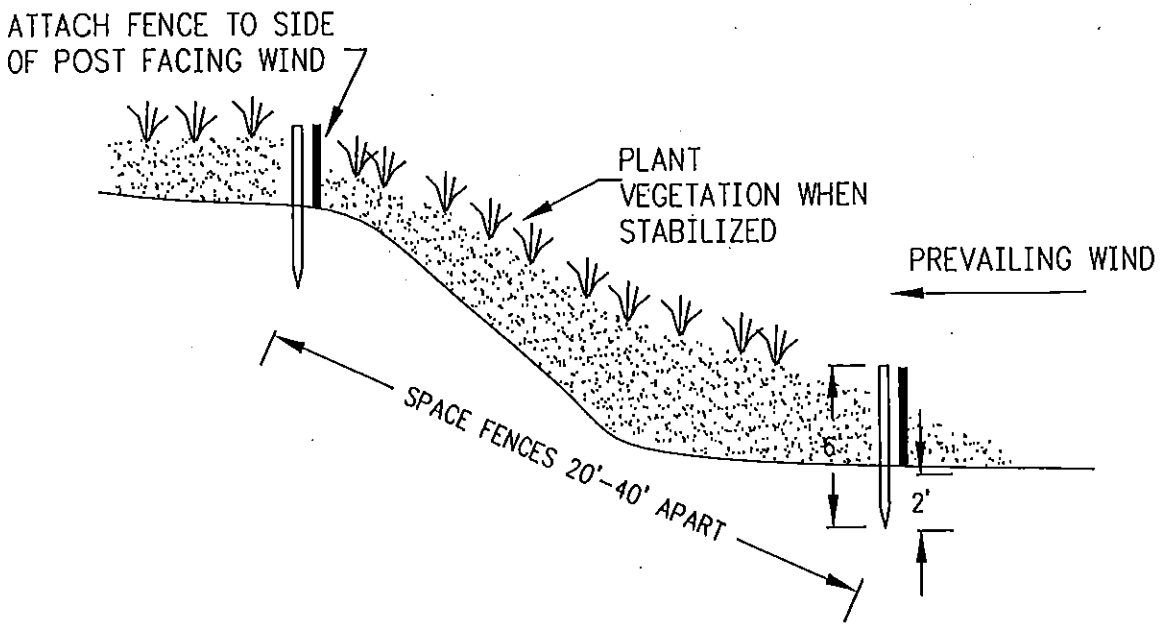
46. STONE FILTER BERM

When	• Runoff from disturbed areas requires filtering before leaving a construction site.
Why	• To reduce the flow velocity and filter sediment from runoff.
Where	• In areas where sheet flow or rill flow occurs from small drainage areas. • In drainage ways where intermittent concentrated flow will not exceed 2 feet per second. • Along a site perimeter. • Across construction site access roads. • Around temporary spoil areas. • Along segments of a stream or drain.
Scheduling	• Year around.
How	1. Use 3/4 to 3 inch size stone in areas of sheet flow and 3 to 5 inch stone in areas with concentrated flow. 2. Construct a sump area large enough to detain runoff volume on the upslope side of the berm where runoff can pond and sediment can settle. If drainage area is large a sediment basin may be needed. 3. Allow ample room in to allow equipment access for sediment removal and maintenance of the berm.
Maintenance	• Inspect routinely and following each precipitation event that results in runoff, to assure filter berm has not plugged. Remove accumulated sediment and repair and replace gravel as needed to maintain adequate filtering and prevent berm overtopping and ultimate failure.
Limitations	• Should not be used in place of a check dam in a flowing ditch because they are unable to withstand velocities in excess of 2 feet per second. • Not for use in concentrated, continuous flow areas. • Not for use in areas intended for mowing.

47. SAND FENCE

When	• In areas susceptible to wind erosion, particularly where soil has not yet been stabilized through other means.
Why	• To reduce wind velocities, reducing erosion. • To trap blowing sand, reducing off-site sedimentation. • To assist in stabilizing or re-building a slope.
Where	• Along coastal dunes, open areas subject to frequent wind, along roads, work areas, and adjacent to agricultural fields.
Scheduling	• Year around.
How	1. Sand fences are generally made from wooden slats spaced approximately 1.5 inches apart or consist of plastic web material. 2. Place sand fence perpendicular to the prevailing wind direction. 3. Anchor fence with sturdy posts at least 6 feet long. Drive posts into the ground approximately 2 feet. 4. Space the posts approximately 13 feet apart. Spacing may be altered to ensure posts are placed at low points. 5. Securely attach sand fence to posts on the windward side. Tying or nailing fence material to each post is often the method used. 6. The bottom of the fence must be set securely into the ground. 7. To continue effectiveness when needed, add another row of fence when the first row has accumulated sand up to 2/3 its height. 8. When sand fence is used to re-build a slope, plant vegetation to stabilize the sand when sand accumulation has slowed significantly. 9. When sand fence is used to reduce wind erosion, remove fence after disturbed areas have stabilized.
Maintenance	• Inspect routinely and add or maintain fence until all disturbed areas are stabilized.
Limitations	• Removal of fence may disturb established vegetation in stabilized areas unless adequate equipment access routes are planned.

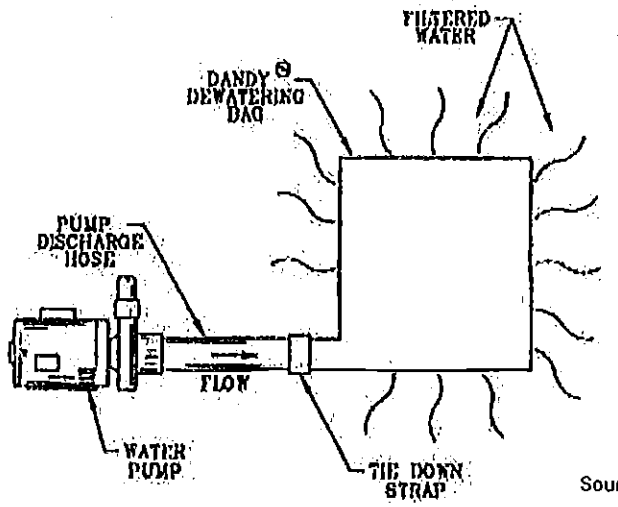




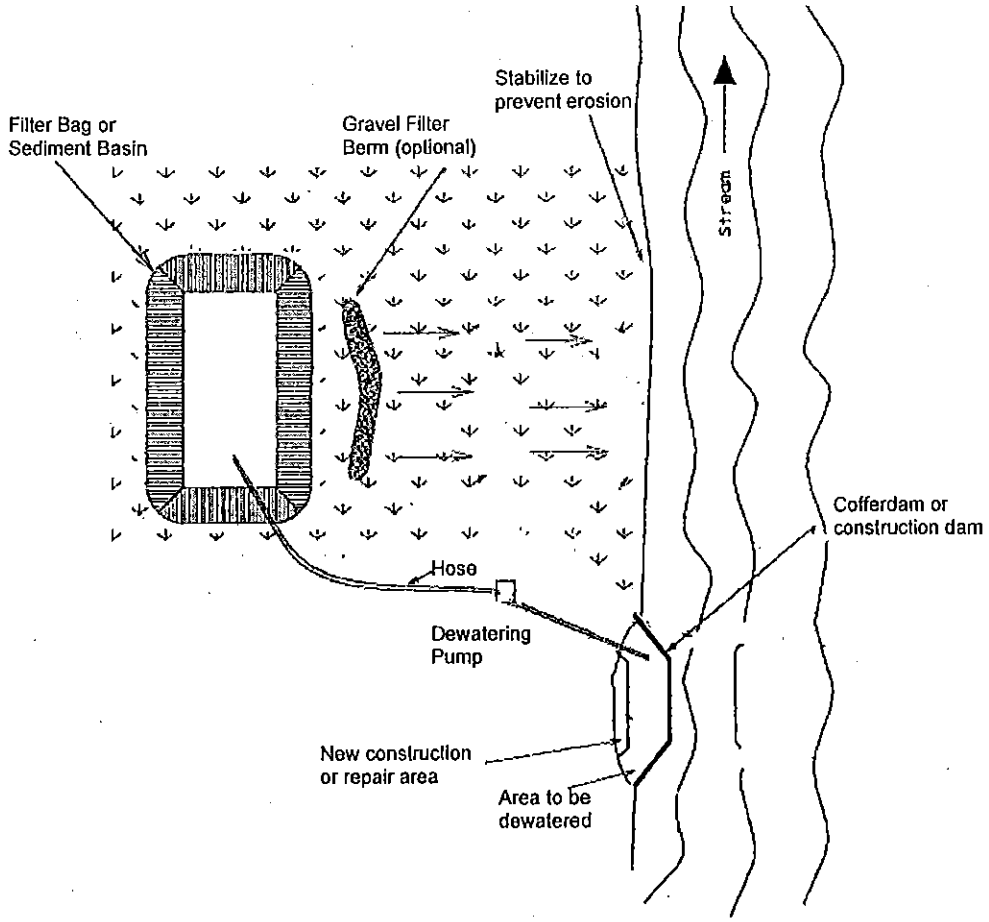
Source: State of Michigan, Department of Management and Budget, SESC Guidebook

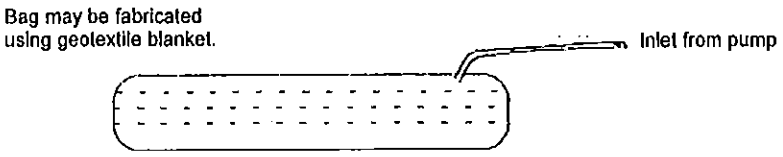
48. DEWATERING

When	• Construction activities are limited by the presence of water and a dry work area is required. • Maintenance activities require lower water levels. • Accumulated stormwater must be discharged.
Why	• To remove groundwater or surface water to facilitate construction activities.
Where	• A high groundwater table limits construction activities. • Within or adjacent to a stream or drain. • In stormwater basins.
Scheduling	• Year around.
How	1. Utilize an engineer to design a dewatering system with sufficient size and capacity to maintain a dry condition without delays during construction or maintenance operations and to provide an adequate sediment basin when needed. 2. Design and stabilize dewatering system discharge point to prevent scouring of the receiving waters. 3. If sediment filtration is required, water should be filtered through a stone filter near dewatering pump inlet or released through a filter, designed for this purpose, prior to discharge. 4. Sediment accumulated with a filtering system must be either spread and stabilized within the drain easement or properly disposed of off site.
Maintenance	• Maintain sediment controls and filters in good working order. • Inspect dewatering discharge points daily for signs of scour and erosion. • Repair any problems immediately.
Limitations	• Does not provide filtration of contaminated water. • Requires adequate sediment settling area or filtration system to remove sediment. • Freezing temperature may limit the use of filter bags.



Source: Dandy Bag ®





Water seeps out of bag from all sides and is most efficient when placed on flat ground.

Source: Adapted from Michigan Department of Transportation

49. STRAW BALES

When	• As a temporary diversion structure. • Occasionally as an alternative to silt fence for projects that will be completed within a very short time period (less than one month).
Why	• To divert flow to a protected area during soil disturbance preventing suspended sediments from leaving the drain easement or entering a drain. • Effective when used during minor soil disturbance activities. Very effective for short time periods and create little disturbance when installed and removed. Additionally, straw may be used as mulch when removed.
Where	• Adjacent to critical areas, such as wetlands, and along drain easement boundaries.
Scheduling	• Year around if ground is not frozen.
How	1. Trench in a minimum of 4 inches and butt the bales tightly together to prevent water and sediment from passing between them and stake.
Maintenance	• Routinely inspect bales following each precipitation event that results in runoff. • On extended projects straw bales may require replacement. • Remove straw bales when vegetation has been established.
Limitations	• Trenching the straw bales is time consuming. • Straw bales deteriorate rapidly, often in 60 to 90 days. • The straw swells when becoming wet so very little if any water will pass through, often resulting in overtopping or failure of the bail barrier. • Straw bales are ineffective in areas of concentrated flow, such as in the drain, or directly downstream of outlets.

SECTION 6

Routine Maintenance Activity Details

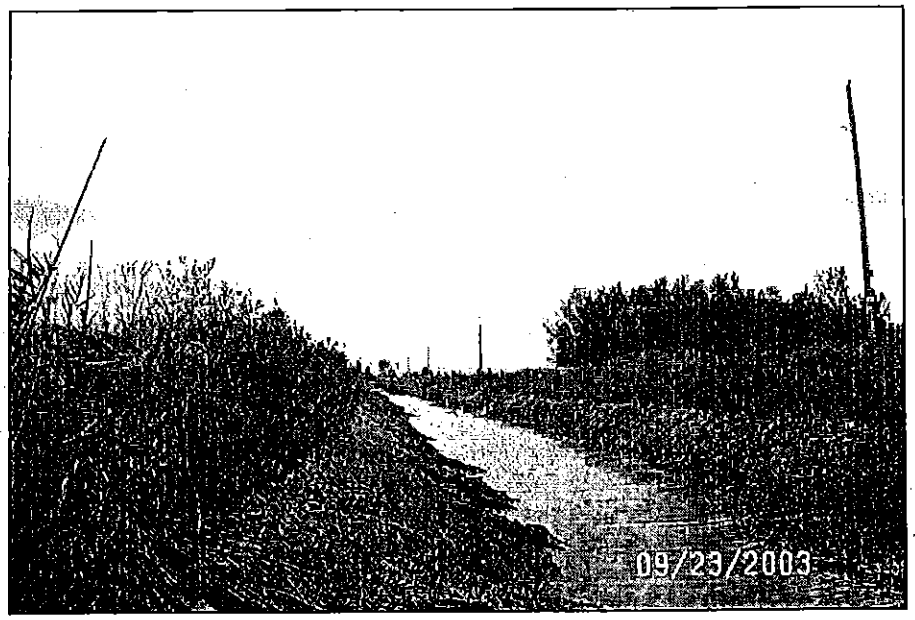
80. DEBRIS REMOVAL

When	• Deadfall, and other objects, such as shopping carts, tires, appliances, and mattresses have accumulated in the drain.
Why	• To prevent flooding. • To prevent or remove blockages and safety hazards. • To prevent bottom scour and drain bank erosion.
Where	• In county drains.
Scheduling	• Preferably during lower flow periods. • Some locations require routine debris removal. • During an emergency.
How	1. Remove debris minimizing channel bottom and bank disturbance. 2. When trees are uprooted and fall into a drain, cut tree off above root ball and cut tree into manageable lengths and remove from the drain. If possible reposition root ball back into its original position anchoring appropriately or remove the root ball and fill and stabilize area.
Maintenance	• Inspect disturbed areas routinely and following each precipitation event that results in runoff until stabilized.
Limitations	• Access. • Cost of retrieval and disposal. • Equipment availability. • Safety concerns.

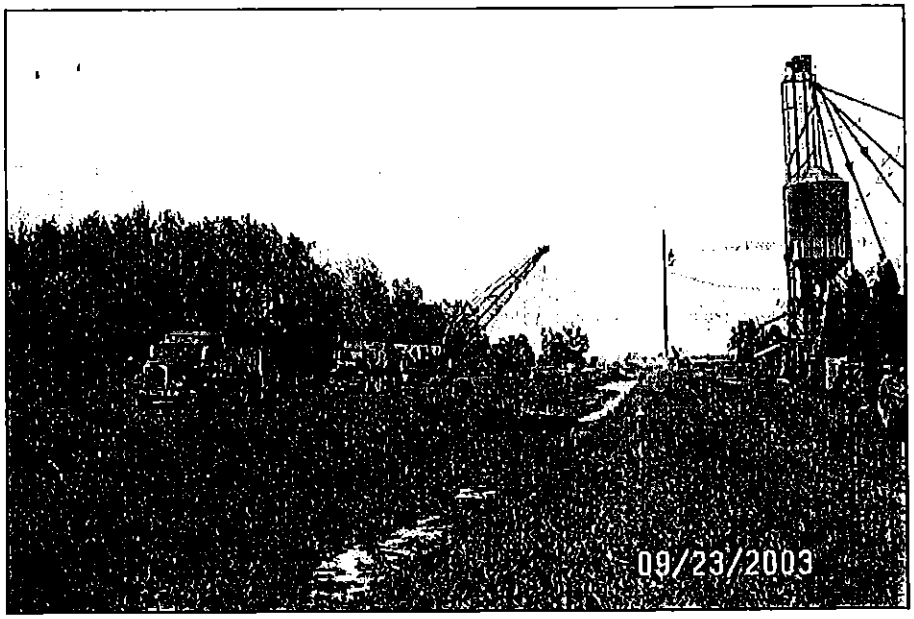
81. SEDIMENT REMOVAL

When	• When sediment has accumulated above the dimensions of the drain as legally established or constructed and the drain is not providing adequate drainage.
Why	• Remove sediment accumulation restoring proper drain function.
Where	• Sediment has accumulated in reaches of a drain preventing the drain from functioning as legally established or constructed.
Scheduling	• During low flow or frozen ground conditions. • Avoid sediment removal and spreading of spoil piles during spring thaw due to soil instability and when crops will be damaged.
How	1. Inspect drain and document eroding outfalls, obstructions, and areas of sediment accumulation. Prioritize maintenance activities and identify needed equipment. Seek engineering support when needed to analyze the drain profile in identifying reaches that need to be dredged and/or to design SESC measures taking into account the soil type, flow conditions and length of time from initial earth disturbance to project completion. **A SESC plan must be developed prior to the initial earth disturbance.** 2. Prioritize and schedule maintenance, taking into account adjacent land use activities. 3. Prepare access along bank. When practical clear north and east banks to maintain shading of the stream. 4. Install downstream sediment control measures such as sediment sumps and check dams or sheet pilling prior to commencing earth change activities. 5. Install all other necessary SESC measures. 6. When practical, begin sediment removal downstream and work upstream. 7. Deposit spoils along the edge of the drain easement as far away from the drain as possible maintaining a natural buffer strip and leaving openings for natural drainage to occur. Do not place spoils in a regulated wetland unless it is a historic spoil area without a wetlands permit. 8. Seed, apply mulch when necessary, or otherwise stabilize disturbed drain banks daily and stabilize disturbed areas, either temporarily or permanently, within 5 days. 9. Spread spoils to prevent erosion and ditch bank surcharge and seed or otherwise stabilize spread spoils within 5 days. If spoils will be spread at a later date, seed, apply mulch when necessary, or otherwise stabilize spoil piles within 5 days except where spoil piles will interfere with plowing tilling or the harvesting of crops. If spoil piles will be left slope spoils toward agricultural fields and away from the stream or drain. 10. When removing sediment in the winter during freezing temperatures, dormant seed spoil piles daily using additional erosion control measures as required to prevent erosion.
Maintenance	• Inspect erosion and sediment controls routinely and following a precipitation event that results in runoff until disturbed areas are stabilized.

Limitations	• Cost. • Access is limited by the drain easement dimensions. • The cost of frequent sediment removal resulting from unregulated sediment sources such as plowing and tilling, and urban land uses. • Additional SESC measures may be needed during the non growing season.



Maintenance of a natural buffer strip between spoils and reconstructed drain prior to drain bank stabilization.



Excavated sediment and soils being trucked off-site during a drain reconstruction project.

Source: Sarah Pistro, Tuscola County Drain Commissioner

82. Stormwater Basin Maintenance

When	• Sediment has accumulated and is limiting storage volume. • Excessive vegetation or brush accumulates in the bottom or along the banks. • Structural components require maintenance. • Wetland vegetation is being negatively impacted.
Why	• To maintain the design capacity and control sediment and other pollutants.
Where	• In constructed stormwater basins.
Scheduling	• When the basin water level is low and rainfall is not anticipated. • Brush removal during times of frozen ground, ice cover, or drought conditions will minimize soil disturbance.
How	1. In wet basins, dewater basin if outlet structure can be adjusted for dewatering; and pump or divert incoming flow around basin until sediment removal is complete and vegetation is reestablished. Vegetation can be controlled by hand cutting or by applying an aquatic labeled herbicide by a certified applicator. 2. In dry basins, remove vegetation during low flow or dry periods by brushing or by applying an aquatic labeled herbicide by a certified applicator. Stabilize disturbed areas. 3. Remove brush to an upland area within the drain easement or haul offsite. 4. Test spoils, if required, to determine appropriate locations for disposal. 5. Spread sediment spoils in an upland area within the drain easement or haul to an appropriate offsite area and stabilize.
Maintenance	• Inspect spoil deposition and disturbed areas routinely until stabilized. • Monitor basin for future sediment and vegetation accumulation. • Establish a maintenance schedule for mowing of dry basins.
Limitations	• Herbicides must be applied by a certified applicator. • If an herbicide is used in water it must be labeled for aquatic use.

83. VEGETATION REMOVAL WITHOUT GRUBBING

When	• Vegetation limits flow capacity. • Vegetation poses a threat to channel and bank stability. • Access is required.
Why	• Brushing without grubbing reduces sheet flow velocities preventing rilling and gullying, maintaining slope stability. • Trees and/or stumps located below the ordinary high water mark may cause channel restrictions, stream bottom scour, and drain bank erosion unless removed.
Where	• In drain easements, stream or drain banks and within the channel.
Scheduling	• Year around; consider nesting and spawning seasons and critical habitat.
How	1. Identify areas which need to be sprayed or brushed. If possible, maintain vegetation on south and west drain banks. 2. Chemical applicators, heavy equipment, light machinery, and hand tools, may be needed. 3. Cut vegetation within a few inches of the ground surface, leave root zone intact and do not grade area. Stump treatments may be applied to prevent re-sprouting. 4. Remove cut vegetation and pile within drain easement. 5. If a tree must be cut from within the channel, cut during low flow conditions.
Maintenance	• Where vegetation growth hinders flow capacity mow or chemically spray as needed.
Limitations	• Stumps and other woody remnants inhibit mowing. • May temporarily disrupt habitat.

84. VEGETATION REMOVAL WITH SELECTIVE GRUBBING

When	• Vegetation roots pose a threat to channel and bank stability. • Access is required. •
Why	• Selective grubbing maintains selective vegetation to reduce sheet flow velocities preventing rilling and gullying, maintaining slope stability. • Trees and/or stumps located below the ordinary high water mark may cause channel restrictions, stream bottom scour, and drain bank erosion unless removed.
Where	• In drain easements, drain banks, or within the channel, and grubbing is isolated to less than 100 linear feet at any one location..
Scheduling	• Year around; consider nesting and spawning seasons and critical habitat.
How	1. Selectively identify areas which must be grubbed leaving intermittent vegetation where feasible to reduce sheet flow velocities and assist in the reestablishment of vegetation (See Vegetation Removal without Grubbing). When possible, avoid the south and west drain banks. 2. **A SESC Plan must be developed prior to the initial earth disturbance when the project differs from these specifications, including when any isolated areas of grubbing will exceed 100 linear feet.** 3. Place appropriate downstream sediment control measures, such as a check dam, when working in the channel. 4. Heavy equipment, light machinery, and hand tools, may be needed. 5. Flush cut trees wherever possible, to leave roots in place for bank stabilization. 6. In areas where grubbing is required, remove vegetation, minimizing the disturbance of surrounding vegetation. 7. Grade soil surface as required, fill in voids, compact soil, and seed. 8. Apply mulch and/or erosion control blankets during the non-growing season. (Mulch is optional during the growing season.) 9. Remove any accumulated sediment from behind downstream erosion control device(s). Place sediment in vegetation on the right of way, as far from the drain as possible. 10. Remove sediment control measures after disturbed area is covered with mulch and/or erosion control blanket, or after the disturbed area is stabilized. 11. If a tree must be removed from the channel bottom when the stream is flowing, install downstream temporary sediment controls, cut tree and pile within drain easement, pull stump, allow channel bottom to stabilize, and then remove downstream sediment control measures as described above.
Maintenance	• Inspect routinely and following each precipitation event that results in runoff until stabilized.
Limitations	• May temporarily disrupt habitat.

85. SLOPE AND STREAMBANK STABILIZATION

When	• Existing slope or drain bank is failing and erosion is occurring. • Runoff inflows must be redirected within the drain easements.
Why	• To reduce flow to non erosive velocities, prevent erosion, and stabilize the slope or drain bank.
Where	• Isolated locations where total corrective action(s) will disturb less than 100 linear feet.
Scheduling	• During low flow conditions, often concurrently with sediment removal, ditch reconstruction or maintenance activities.
How	1. Identify areas where slope flattening or other corrective measures would stabilize bank 2. **A SESC plan must be developed prior to the initial earth disturbance when the project differs from these specifications of when isolated corrective actions will disturb more than 100 linear feet.** 3. Determine the cause of the problem and necessary corrective actions. 4. Determine the appropriate start date and scheduling for the project. 5. Define construction work and staging limits. 6. Place appropriate downstream sediment control measures such as check dam and sediment sump. 7. Divert off site concentrated sources of runoff (if present) away from earthwork area. 8. Remove selected trees, if necessary, minimizing the disturbance of existing vegetation. 9. Salvage topsoil and temporarily store in drain easement leaving a natural buffer of vegetation between the spoils and the drain. 10. Reshape slopes and bottom to design dimensions or to match upstream and downstream slopes and bottom contours. 11. In areas requiring filling, place fill material and compact it with excavator bucket. (Note: if using geogrids, live fascines, or wattles of native vegetation, they should be placed prior to, or in conjunction with, the fill material.) 12. Replace topsoil and pack it in with excavator bucket. 13. Place seed and the appropriate mulch/BMP on the repaired and stockpile areas. Hydroseeding may be used in lieu of seed and mulch. 14. Place and stake erosion control blanket from top of slope to the bottom of the channel. 15. Install appropriate BMP at the toe of the reshaped bank to protect it from erosive velocities. 16. Remove any accumulated sediment from behind the check dam and place sediment in vegetation on the right of way, as far from the drain as possible. 17. Remove downstream sediment control measure(s). 18. Hydroseeding may be used in lieu of ***seed*** and ***mulch.***
Maintenance	• Inspect routinely and following each significant precipitation event that results in runoff until stabilized then remove temporary control measures.
Limitations	• During hot, dry summer conditions and/or in sandy soil conditions where stabilization is difficult.

86. Drain Crossing Maintenance

When	• Flow is restricted due to sediment and debris accumulation in a culvert or bridge opening.
Why	• To maintain proper flow capacity.
Where	• Inside and adjacent to a culvert or bridge.
Scheduling	• During lower flow conditions. • When an emergency occurs as a result of blockage.
How	1. When sediments are removed by hand; or with an auger machine, pressurized water jet, or excavator, temporary sediment controls, such as a ***sediment sump, check dam,*** *or* ***polymer flocculent,*** shall be installed downstream within 100 feet of the structure outlet prior to cleanout. Remove sediment and downstream temporary control measures when cleanout is complete. 2. Use a vacuum truck.
Maintenance	• Monitor culvert or bridge to assure maintenance of flow capacity. • If sediment accumulation is a continued maintenance problem and erosion problems have been resolved, utilize an engineer to evaluate if the crossing should be replaced with an alternative design configuration. This may include placing the culvert or bridge at a different elevation, realigning the structure, or replacing the culvert, multiple culverts, or a bridge with an alternate design.
Limitations	• Cost. • Access. • Equipment availability.

87. ENCLOSED DRAIN MAINTENANCE

When	• When sink (blow) holes are observed above tile or a tile blockage is evident. • When tile has deteriorated and needs to be replaced or lined.
Why	• To maintain drainage.
Where	• In enclosed tile drainage systems.
Scheduling	• When the drain is dry or at a low flow if possible. • When an emergency blockage has occurred. • Immediately upon notification or discovery of a sink hole.
How	1. If flow is present, water diversion may be required and sediment must be controlled. 2. Excavate existing tile as necessary. If possible bulkhead downstream end of existing tile during repair. 3. Install tile, sealing joints when necessary, or follow manufacturer's recommendations for new pipe installation. 4. Backfill with appropriate material, compacting bedding to provide adequate support for tile. 5. When tile is in a road right-of-way compact in lifts adequate to prevent settling of the road surface. Contact MDOT or County Road Commission for guidance. 6. Check tile outlet to assure it is operating properly and is not blocked. 7. Stabilize disturbed areas. 8. Install downstream SESC measures prior to using an auger machine or water jet to remove sediment or a blockage from an enclosed drain.
Maintenance	• Inspect disturbed areas routinely and following each precipitation event that results in runoff until disturbed areas are stabilized. • Remove trapped sediment and temporary control measures after the area has stabilized.
Limitations	• Soil must be properly compacted to prevent road failure. • Equipment availability. • Flow conditions. • Cost.

SECTION 7

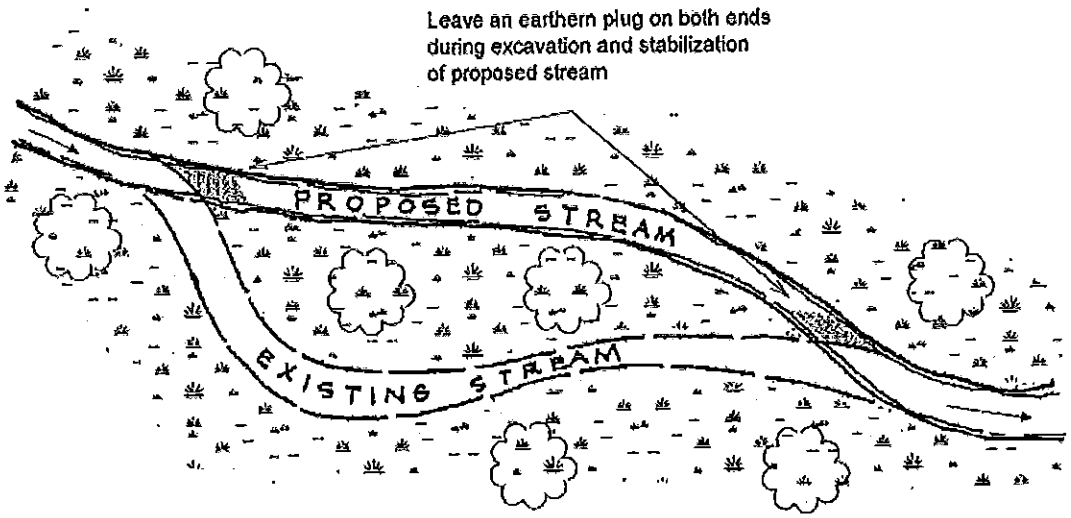
Construction & Restoration Activity Details

100. Stormwater Basin Construction

When	• Land development will permanently increase runoff volumes, discharge rates and flow velocities. • Existing runoff conditions cause stream channel degradation.
Why	• To provide additional storage for runoff volumes. • To reduce peak discharges to pre development conditions. • To prevent erosive velocities. • To improve water quality by removing sediments and other pollutants; especially when a forebay or sediment basin is constructed as part of the stormwater basin.
Where	• Within a drainage system where flow detention or retention is necessary. • In developments.
Scheduling	• Year around if adequate erosion and sediment controls are provided.
How	1. Obtain a temporary construction drain easement and a permanent drain easement for long term maintenance and spoils deposition. 2. An engineer shall be retained to design the stormwater basin and develop a long term maintenance plan.
Maintenance	• Inspect temporary erosion and sediment controls routinely; and following each precipitation event that results in runoff until permanent control measures are installed and disturbed areas are stabilized. • Remove temporary control measures after all areas are stabilized. • See *Stormwater Basin Maintenance*.
Limitations	• Cost. • May require land/drain easement acquisition.

101. DRAIN RELOCATION

When	• When petitioned to relocate a drain.
Why	• To prevent or control drain bank erosion. • When a drain has meandered outside of the drain easement and must be relocated to its original location. • To accommodate construction or improvement, including safety, of a roadway or other structural action.
Where	• In a new location with consideration for the topography and to minimize environmental disturbances.
Scheduling	• Year around, during lower flow periods.
How	1. Utilize a qualified engineer for the drain relocation design with consideration for the topography and to minimize environmental disturbances. 2. Construct in-stream ***sediment sumps, check dams***, and other required downstream sediment measures. 3. If excavated soils will be used to fill abandoned channel, stockpile soil near site in an upland area and stabilize stockpile with ***seed***, mulching if necessary, or cover with ***plastic sheets***. Otherwise, level soils within drain easement and stabilize. 4. Do not plug or fill in old channel until relocated channel has been stabilized. If plugging or filling old channel, stabilization at both ends may be appropriate. 5. Excavate new channel leaving earthen plugs at each end until entire relocated channel is graded and stabilized. 6. Remove earthen plugs, beginning with the downstream plug first. 7. Fill in abandoned channel, compacting as required. 8. Stabilize all disturbed areas.
Maintenance	• Inspect relocated channel routinely and following each precipitation event that results in runoff until stabilized. • Inspect routinely downstream ***sediment sump***s and catchbasins for sediment accumulation and clean when needed. When all areas are stabilized, remove temporary sediment controls. • After flow is diverted through the stabilized relocated channel, watch for bank erosion, formation of sediment islands, or channel down cutting near ends of relocation and make necessary repairs.
Limitations	• New or additional drain easement may be required. • May decrease stream gradient if longer flow path is required, perhaps resulting in increased sedimentation. • Conversely, may increase stream gradient if shorter flow path is proposed increasing flow velocity and potential channel down cutting.



Source: Michigan Department of Transportation

102. DRAIN ENCLOSURE

When	• Petitioned to tile, or enclose, an existing open drain, or extend or add a branch to an existing drain. • A road or driveway access is required.
Why	• To provide drainage benefits to a property. • Increased use of a property, usually when an open channel drain bisects property that is being developed or when there has been an encroachment. • To increase road safety. • To eliminate severe, chronic erosion problems.
Where	• An open drain bisects a yard or development. • Along a road. • An encroachment has occurred. • Drain flows through unstable soils or a seepage area. • Through chronic high erosion areas (i.e. sand hill).
Scheduling	• Year around, during low flow periods.
How	1. Utilize a qualified engineer for the drain enclosure design and installation specifications which include: tile size, design elevations, slope, and alignment; catchbasins; and materials, bedding, backfill, and compaction requirements. 2. Install downstream sediment measures. 3. Provide a stabilized inlet and outlet. 4. Prior to construction, install and maintain adequate temporary and permanent SESC measures upstream and downstream of the enclosure. 5. Install a temporary bypass channel or a temporary dam and a by pass pump, if necessary. 6. Stabilize all disturbed areas. 7. Remove temporary sediment control measures after all disturbed areas are stabilized.
Maintenance	• Clean catchbasin sumps as needed. • Clean tile if sediment accumulates over time.
Limitations	• Cost. • Subject to root intrusion and sediment blockage over time. • Enclosures may limit the drain capacity.

103. DRAIN CROSSINGS

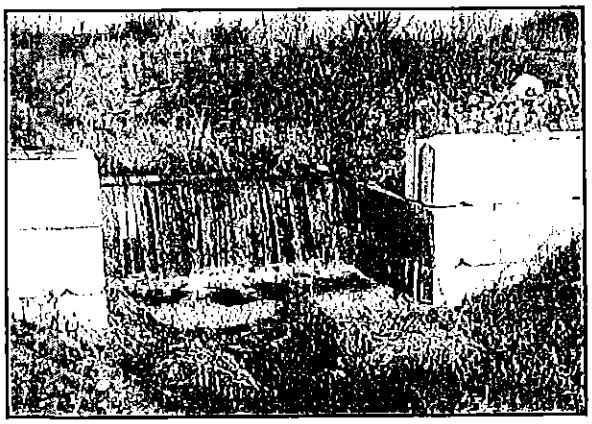
When	• A new crossing is required under petition. • Bridge or culvert is not of sufficient capacity and is obstructing a drain. • Bridge or culvert has deteriorated or failed. • Bridge or culvert was previously improperly installed.
Why	• To provide a safe drain crossing. • To provide sufficient hydraulic capacity. • To correct improper grade, size, or alignment problems. • To replace a failing structure.
Where	• At locations requiring access to the other side of a drain. • At existing drain crossings.
Scheduling	• Year around, preferably during low flow periods. • Additional SESC measures are required during the winter.
How	1. Utilize an engineer to design an adequate crossing for the anticipated loads and flow conditions that will not cause harmful upstream flooding conditions. 2. Install downstream sediment control measures. 3. When stream flow cannot be interrupted install a ***temporary bypass channel*** or a temporary dam and pipe it around or over the crossing to provide a dry work area. Use an earthen plug upstream of crossing if stream flow is minimal and can be interrupted during crossing installation. 4. Install drain crossing per engineer's and manufacturer's specifications. 5. Construct non-erosive end treatments such as: headwalls; riprap; end sections or wing walls; ***seed*** and ***mulch***; or mulch blankets. 6. Restore disturbed areas and ***seed***, ***mulch*** if necessary. 7. If a temporary dam, dike, or earthen plug was used to block or divert flow during construction, remove constriction and stabilize disturbed areas. If a bypass channel or diversion ditch was used, restore and stabilize main channel before removing temporary by-pass channel or diversion ditch. 8. Remove temporary sediment control measures after all disturbed areas are stabilized.
Maintenance	• Inspect routinely and following each precipitation event that results in runoff, checking for downstream scour, erosion at culvert ends, and establishment of seeded and/or mulched areas until entire site is stabilized.
Limitations	• Minimum cover must be maintained over some crossing types. • Soil types and high stream flows.

104. BEAVER DAM REMOVAL

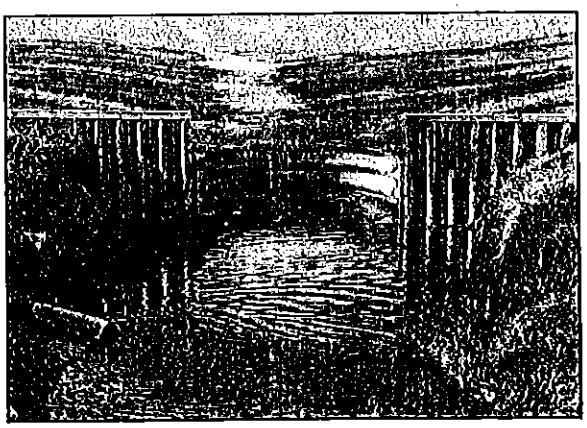
When	• Beaver dams can provide positive functions by serving as a sediment sump and reducing stream velocities and therefore should not always be removed. Under spill structures can be installed to provide passage of flow without causing erosive velocities, bottom scour, and drain bank erosion. • A beaver dam is discovered to be causing a problem. • Routinely in locations where beaver dams are a continual problem and bypass structures are not feasible.
Why	• To prevent flooding. • To prevent or remove a blockage that is causing a problem or safety hazard. • To prevent erosive velocities, bottom scour and drain bank erosion.
Where	• Beavers have constructed dams in county drains.
Scheduling	• As soon as the beavers have been removed from area. • Immediately during an emergency situation.
How	1. Obtain a Damage and Nuisance Animal Control Permit from the local Conservation Officer, Law Enforcement and Wildlife Division, Department of Natural Resources. Permits can be issued on an annual basis when routine beaver dam removal is required. 2. Request the services of a licensed trapper and require the trapper to notify affected landowners prior to removal of beavers from drain easements. 3. Install downstream sediment control measures. 4. Manual removal is preferred. Stage the removal by removing higher elevation debris first and allowing the water level to recede gradually to prevent downstream flooding and erosive velocities. Continue staging the removal until the entire beaver dam is removed. A hydro hose or other equipment may be needed when manual removal is impractical or unsafe. 5. Stabilize disturbed areas. 6. Remove temporary sediment control measures after all disturbed areas are stabilized.
Maintenance	• Inspect disturbed areas routinely and following each precipitation event that results in runoff until stabilized then remove temporary control measures.
Limitations	• Access. • Manual labor and equipment availability. • Safety concerns. • Staging removal to prevent downstream flooding and damage. • Safety of manual labor.

105. WEIR CONSTRUCTION

When	• To stabilize constructed or existing channels when flow is anticipated to exceed the erosive velocity. • To rapidly adjust the gradient of a channel.
Why	• To reduce water velocity minimizing erosion in the channel.
Where	• Within and across an existing or constructed channel.
Scheduling	• Year around, preferably during low flow conditions.
How	1. Configure structure to site specific conditions. 2. Utilize an engineer as necessary to design the structure to pass a 25-year, 24-hour storm and to withstand the hydraulic pressures on the structure components. 3. Install downstream sediment control measures. 4. Interlock weir and wing wall components. 5. Key wing wall and weir into adjacent channel banks and below channel bottom. 6. Dissipate energy with 4 to 18 inch angular riprap immediately below the weir. The angular riprap should be a mix of sizes large enough to dissipate energy and stay in place, with smaller riprap to fill voids. 7. Stabilize all disturbed areas. 8. Remove temporary sediment control measures after all disturbed areas are stabilized.
Maintenance	• Inspect for piping around and through the wing walls and weir wall. • Reposition riprap as necessary or replace with larger rock.
Limitations	• Weir structures with a height greater than 4 feet should not be used without extensive engineering analysis. • Undercutting of the structure below the weir can weaken the structure.



Concrete waste-block structure with weir and wing walls.



Sheet metal piling structure with weir and wing walls.

Source: Tom Doyle, Barry County Drain Commissioner

106. Low Flow Channel

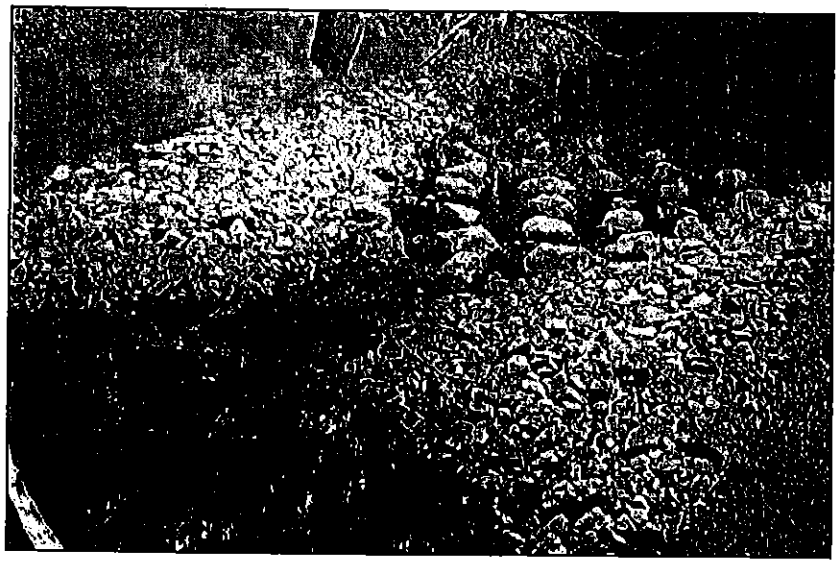
When	• When the original designed dimensions create capacity that exceeds the ability of a watershed to supply base flow in the channel at a desired depth that allows the drain to reach equilibrium. • When removing sediment from a drain. • During a drain restoration project.
Why	• To provide a meandering base flow channel and a bench for sediment deposition without reducing flow capacity. A meandering low flow channel is preferred because the flow velocities will be lower than a straight low flow channel. • To stabilize the drain reducing the required maintenance frequency.
Where	• Within the streambed of an open drain.
Scheduling	• During lower flow conditions when vegetation can be established.
How	1. Utilize an engineer who specializes in stream restoration for the required sediment controls and the floodway shelf design. Design considerations for a floodway shelf include geology, channel slope and sinuosity, contributing drainage area, flow velocity, discharge, sediment transport, sediment particle distribution, and channel geometry 2. Install downstream sediment control measures. 3. Dredge a narrow meandering low flow channel within the existing channel bottom leaving some of the accumulated sediments to serve as a ***floodway shelf***. 4. Seed shelf with a waterway seed mix. 5. Remove sediment controls after ***floodway shelf*** and low flow channel have stabilized.
Maintenance	• Inspect routinely and following significant precipitation events until ***floodway shelf*** and low flow channel are stable. • Inspect every other year and remove woody vegetation from the ***floodway shelf*** and banks to maintain flow capacity and drain bank stability.
Limitations	• Dredge operator must be knowledgeable of geomorphology and fluvial processes.

107. FLOODWAY SHELF

When	• When installing a ***low flow channel.*** • When bankfull capacity of a drain is exceeded at a frequency that results in drain bank erosion.
Why	• To provide a place for sediment to drop out when flow returns to base flow. • To stabilize a ***low flow channel.*** • To provide floodplain storage in flashy streams or drains.
Where	• Above the base flow elevation of a drain.
Scheduling	• During summer or early fall when flow is low.
How	1. Utilize an engineer and/or a qualified professional who specialists in stream restoration for the required sediment controls and the floodway shelf design. Design considerations for a floodway shelf include geology, channel slope and sinuosity, contributing drainage area, flow velocity, discharge, sediment transport, sediment particle distribution, and channel geometry 2. Install downstream sediment control measures. 3. Construct floodway shelf as designed by an engineer under the direction of the engineer's representative. 4. Stabilize all disturbed areas and seed shelf with a waterway seed mix. 5. Remove temporary sediment controls after shelf has stabilized.
Maintenance	• Inspect routinely and following each significant precipitation event until disturbed areas are stabilized.
Limitations	• May require redistribution of a large amount of soil within the drain easement.

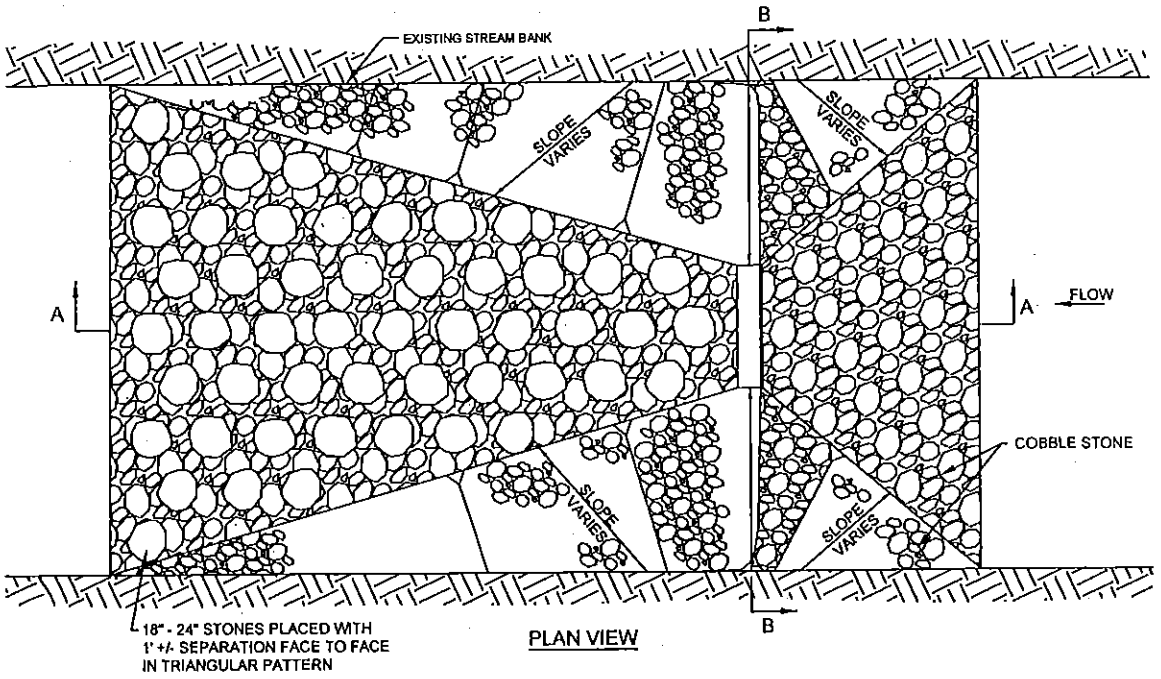
108. RIFFLE ZONES

When	• During a drain maintenance or improvement project ***floodway shelves, low flow channels, pools, riffle zones, J-hook vanes, cross-vanes,*** and ***meanders*** can be created as an alternative to maintaining a straight channel.
Why	• Adds oxygen and maintains a cooler water temperature providing improved water quality and habitat. • At normal flow, flow velocities increase atop riffle zones due to the increased bed slope between the riffle crest and the subsequent ***pool.*** • Used as a grade control structure and to centralize flow.
Where	• Within the channel where the stream bottom is higher relative to streambed elevation immediately upstream or downstream.
Scheduling	• During summer or early fall when flow is low.
How	1. Utilize an engineer and/or qualified professional for the required sediment controls and the riffle zone design. Design consideration must include the range of anticipated discharges and flow velocities, angle of flow, and streambed and drain bank materials. 2. Prepare streambed and drain banks by removing all soil and debris to meet the grading requirements for placement of the stone to create the riffle. 3. Place stone as shown on engineering details. Usually placing stone face to face, using a stone diameter of 18-24 inches, and spaced 1.0 foot apart is required.
Maintenance	• Inspect routinely and following each significant precipitation event and adjust as needed until disturbed areas and riffle zones are stable.
Limitations	• Riffle zones must be designed by an engineer to fit the natural gradient and sinuosity of each individual watercourse.

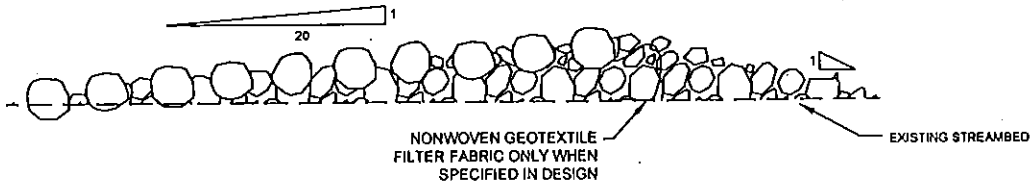


Riffle Zone Installation in Carrier Creek, Eaton County

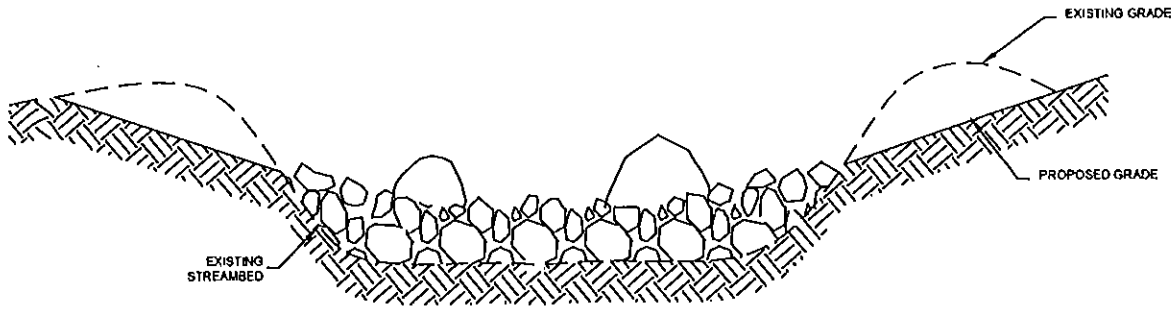
Source: Wetland and Coastal Resources and the Eaton County Drain Commissioner, Brady Harrington



PLAN VIEW



CROSS-SECTION A-A



CROSS-SECTION B-B

Source: Wetland and Coastal Resources, Inc.

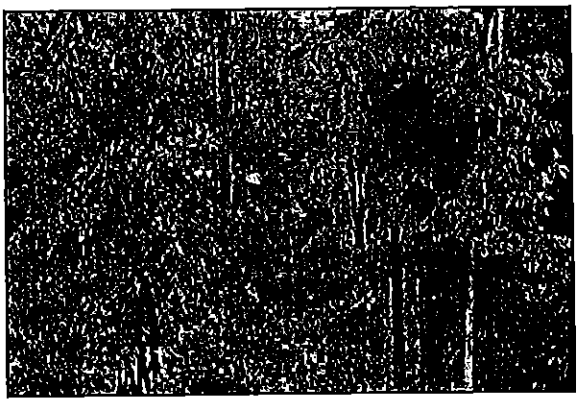
109. POOLS

When	• A drain has very shallow base flow and poor water quality that would be improved by the creation of a ***floodway shelves, low flow channels, pools, riffle zones, J-hook vanes, cross-vanes,*** and ***meanders***
Why	• At normal flow, flow velocities decrease in pool areas, allowing fine grained deposition to occur, and increase atop riffle zones due to the increased bed slope between the riffle crest and the subsequent pool. • Maintains a cooler water temperature providing improved water quality and habitat.
Where	• Within the channel of a drain.
Scheduling	• During summer or early fall when flow is low.
How	1. Utilize an engineer and/or a qualified professional for the required sediment controls and the pool designs. Design consideration must include the range of anticipated discharges and flow velocities, angle of flow, and streambed and drain bank materials. 2. Excavate pool areas under the guidance of the engineer's representative as shown on the engineering plans. 3. Use suitable excavated materials for construction of meanders and as fill around point bars under the direction of the engineer's representative as called for on engineering plans or remove to an upland site and stabilize.
Maintenance	• Inspect routinely and following each significant precipitation event and adjust as needed until pools and meanders are stable.
Limitations	• Pools and meanders must be designed by an engineer to fit the natural gradient and sinuosity of each individual watercourse. • Construction must be overseen by an engineer's representative to assure construction is accomplished per engineering plans.

110. MEANDERS

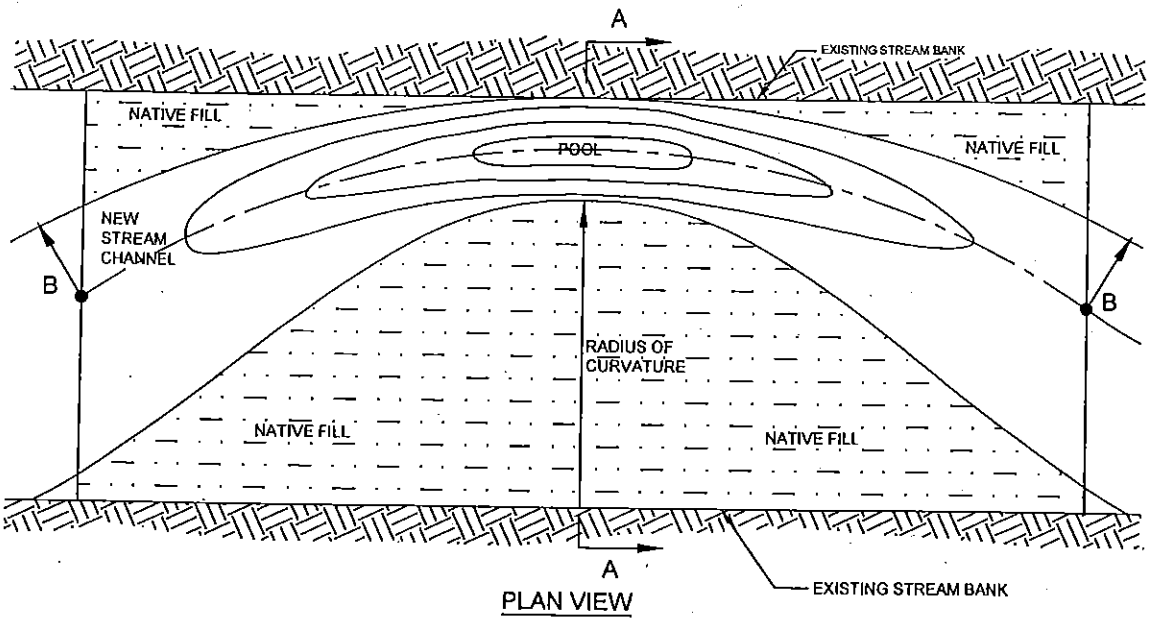
When	• A drain has very shallow base flow and poor water quality that would be improved by the creation of a ***floodway shelves, low flow channels, pools, riffle zones, J-hook vanes, cross-vanes,*** and ***meanders***
Why	• To restore the stream's sinuosity reducing the flow velocity necessary to help maintain channel stability. • To create a deeper, narrower base flow channel minimizing the need for routine sediment removal.
Where	• Within the channel of a drain.
Scheduling	• During summer or early fall when flow is low.
How	1. Utilize an engineer and/or a qualified professional who specializes in stream restoration for the required sediment controls and the meander design. Design consideration must include the range of anticipated discharges and flow velocities, angle of flow, and streambed and drain bank materials. 2. Prepare streambed and drain banks for installing gravel point bar as shown on the engineering plans under the direction of the engineer's representative. 3. If also installing pools, consult engineer's representative to determine if excavated pool material is suitable to construct meander and fill around point bar. If pool material is suitable for construction of meander, place spoil in identified fill section as show on engineering plans. If not, dispose of excavated pool material in an upland area or off site and stabilize. Consult engineer's representative with the identification of local native material to be used. Construct meander and fill around point bar using identified materials per engineering plans.
Maintenance	• Inspect routinely and following each significant precipitation event and adjust as needed until meanders are stabilized.
Limitations	• Meanders must be designed by an engineer to fit the natural gradient and sinuosity of each individual watercourse. • Construction must be overseen by an engineer's representative to assure construction is accomplished per engineering plans.

Carrier Creek prior to installation of meanders.

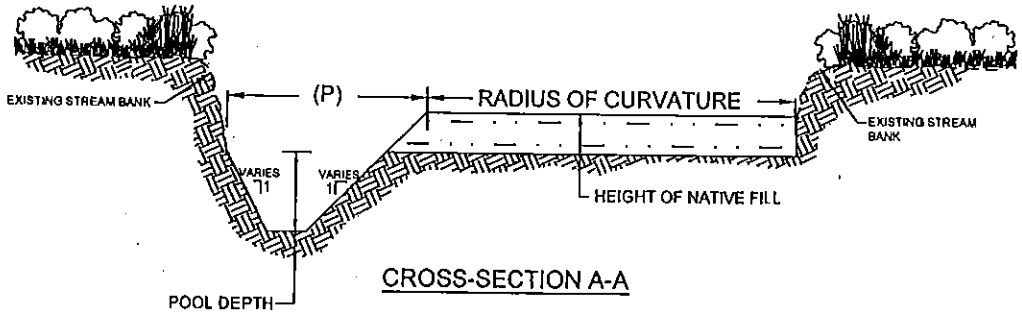


Meander installation in Carrier Creek, Eaton County.

Source: Wetland and Coastal Resources and the Eaton County Drain Commissioner, Brady Harrington,



PLAN VIEW



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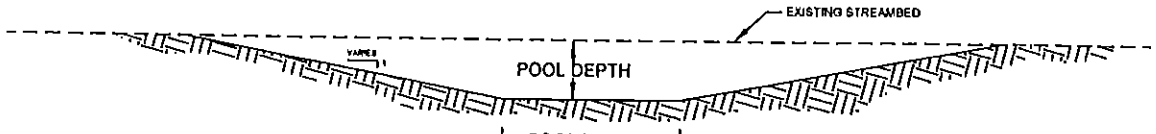
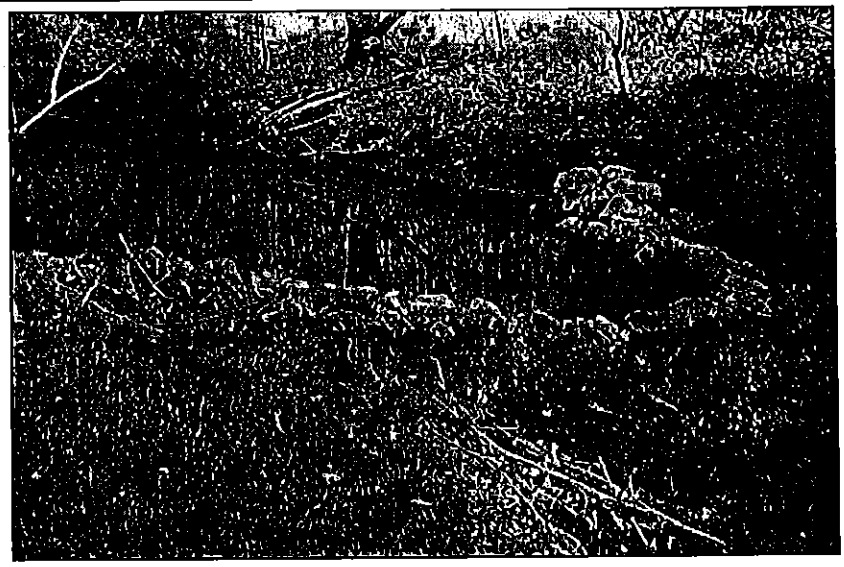


CROSS-SECTION B-B

Source: Wetland and Coastal Resources, Inc.

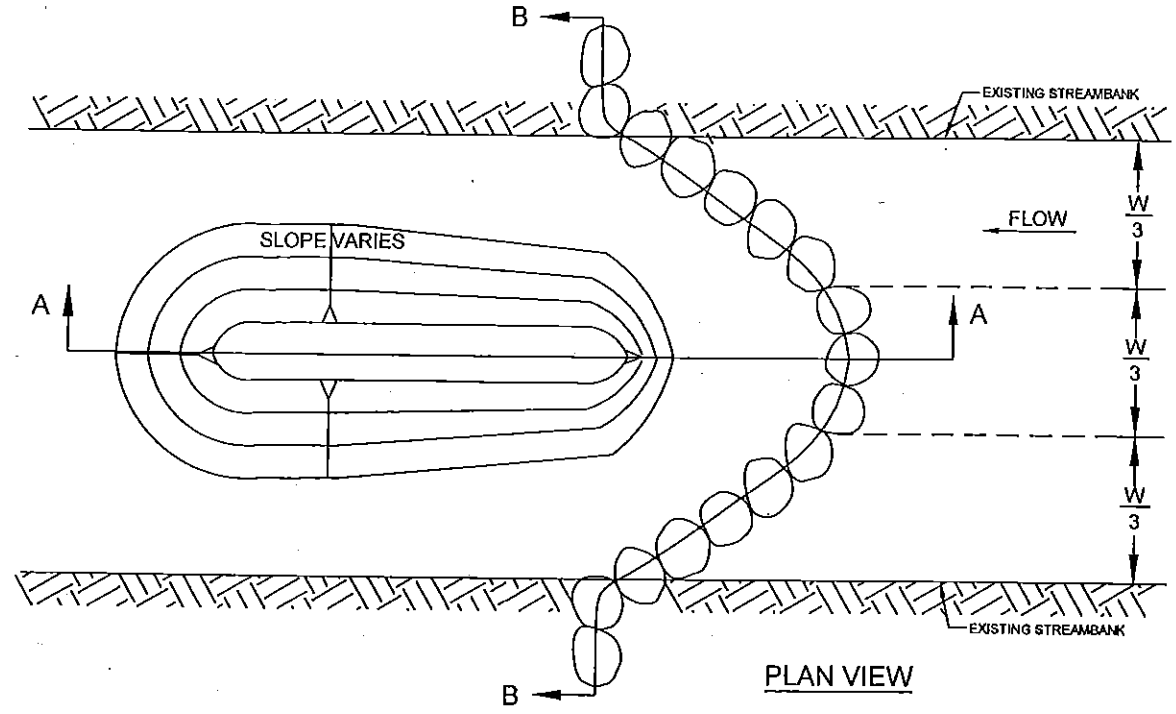
111. CROSS-VANES

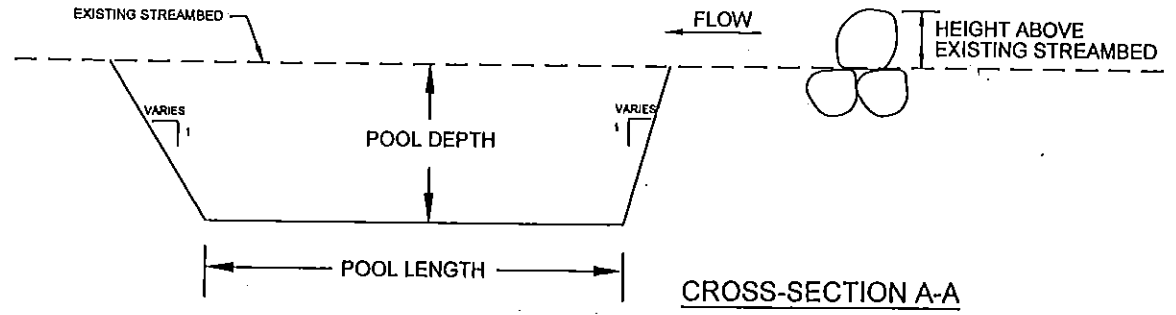
When	• During a drain maintenance or improvement project ***floodway shelves, low flow channels, pools, riffle zones, J-hook vanes, cross-vanes,*** and ***meanders*** can be created as an alternative to maintaining a straight channel.
Why	• Reduces near bank shear stress, centralizes flow, grade control and stabilizes eroding banks. • Adds oxygen and maintains a cooler water temperature providing improved water quality and habitat. • At normal flow, flow velocities increase atop cross-vanes and riffle zones due to the increased bed slope between the cross vane and riffle crest and the subsequent ***pool.***
Where	• Within the channel where the stream bottom is higher relative to streambed elevation immediately upstream or downstream.
Scheduling	• During summer or early fall when flow is low.
How	1. Utilize an engineer and/or a qualified professional who specializes in stream restoration for the required sediment controls and the cross vane design. Design consideration must include the range of anticipated discharges and flow velocities, angle of flow, and streambed and drain bank materials. 2. Prepare streambed and drain banks by removing all soil and debris to meet the grading requirements for placement of cross vane. 3. Place stone as shown on engineering details.
Maintenance	• Inspect routinely and following each significant precipitation event and adjust as needed until disturbed areas and cross vane are stable.
Limitations	• Cross-vanes must be designed by an engineer to fit the natural gradient and sinuosity of each individual watercourse.

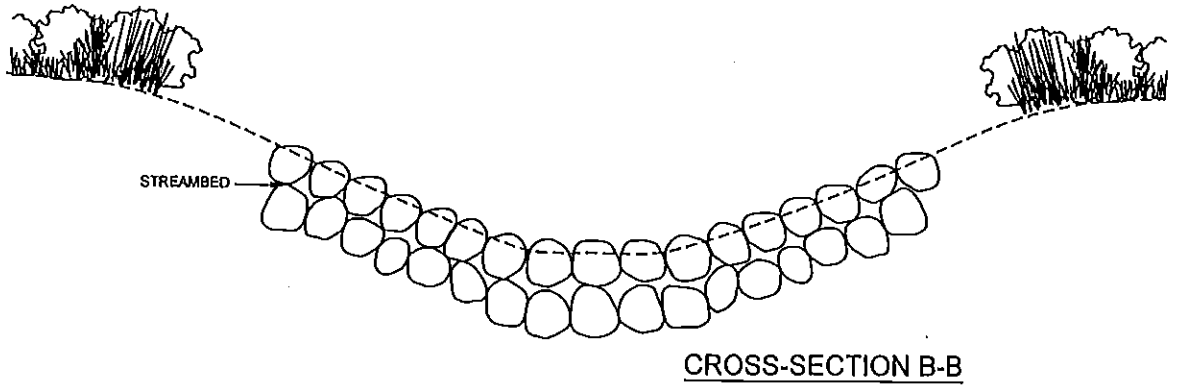


Cross-Vane in Carrier Creek, Eaton County

Source: Wetland and Coastal Resources and the Eaton County Drain Commissioner, Brady Harrington



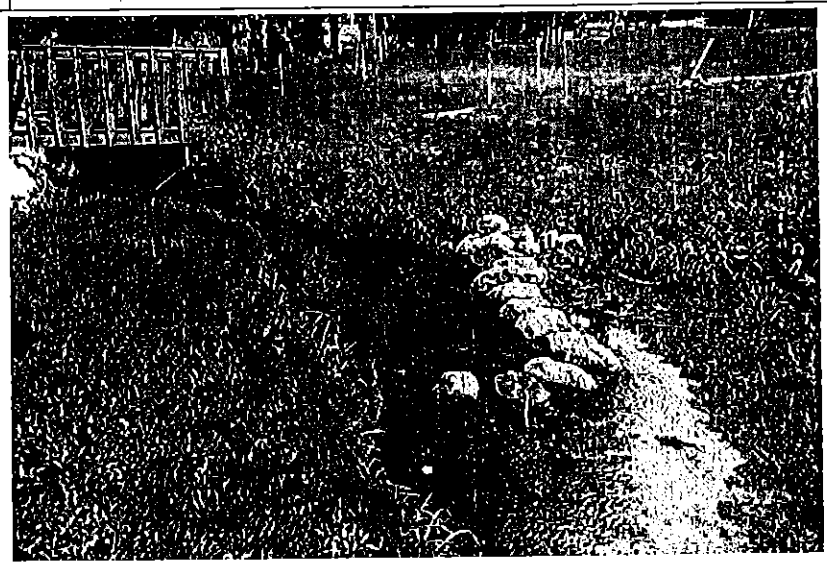




Source: Adapted from Rosgen, D. L., J Hook and Cross Vane, ASCE Wetland and Stream Restoration Conference 2001, Reno, NV.

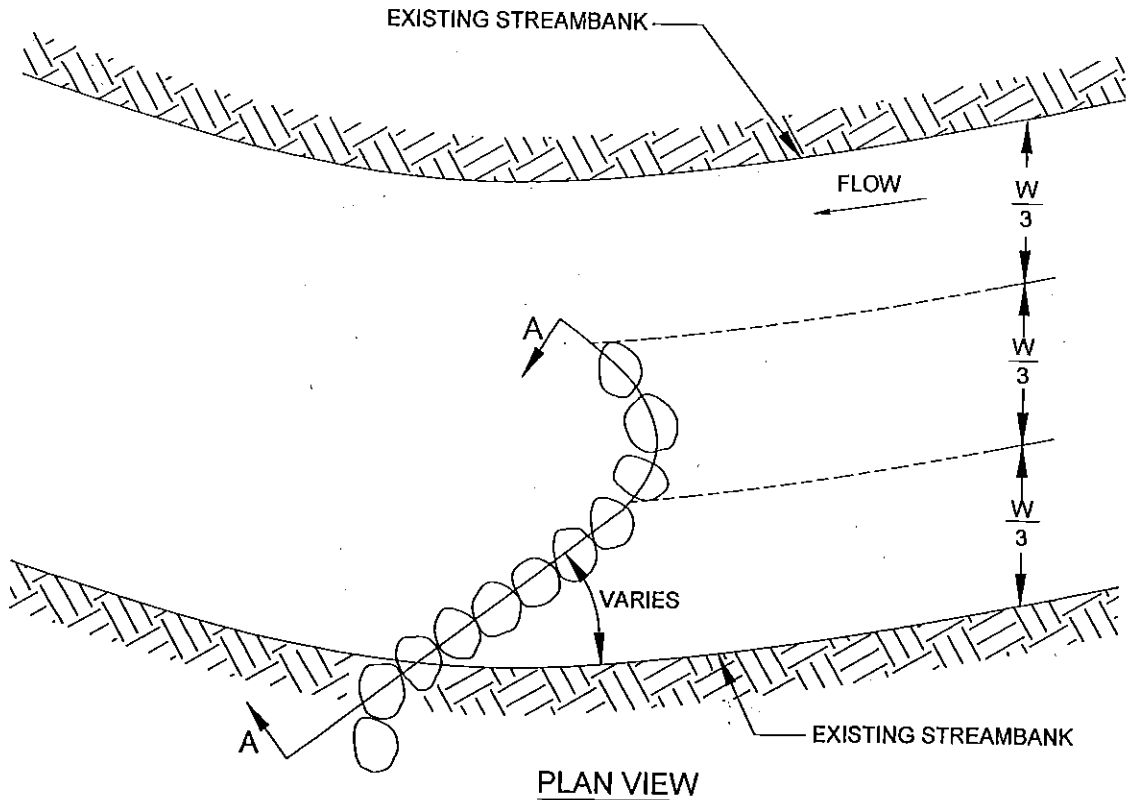
112. J-HOOK VANES

When	• During a drain maintenance or improvement project ***floodway shelves, low flow channels, pools, riffle zones, J-hook vanes, cross-vanes,*** and ***meanders*** can be created as an alternative to maintaining a straight channel.
Why	• Reduces near bank shear stress, centralizes flow, grade control and stabilizes eroding banks on the outer bend of meanders. • Adds oxygen and maintains a cooler water temperature providing improved water quality and habitat. • At normal flow, flow velocities increase atop cross-vanes and riffle zones due to the increased bed slope between the J-hook vanes and riffle crest and the subsequent ***pool***.
Where	• Within the channel where the stream bottom is higher relative to streambed elevation immediately upstream or downstream.
Scheduling	• During summer or early fall when flow is low.
How	1. Utilize an engineer and/or qualified professional who specializes in stream restoration for the required sediment controls and the J-hook vanes design. Design consideration must include the range of anticipated discharges and flow velocities, angle of flow, and streambed and drain bank materials. 2. Prepare streambed and drain banks by removing all soil and debris to meet the grading requirements for placement of J-hook vanes. 3. Place stone as shown on the engineering details.
Maintenance	• Inspect routinely and following each significant precipitation event and adjust as needed until disturbed areas and J-hook vanes are stabilized.
Limitations	• J-hook vanes must be designed by an engineer to fit the natural gradient and sinuosity of each individual watercourse.

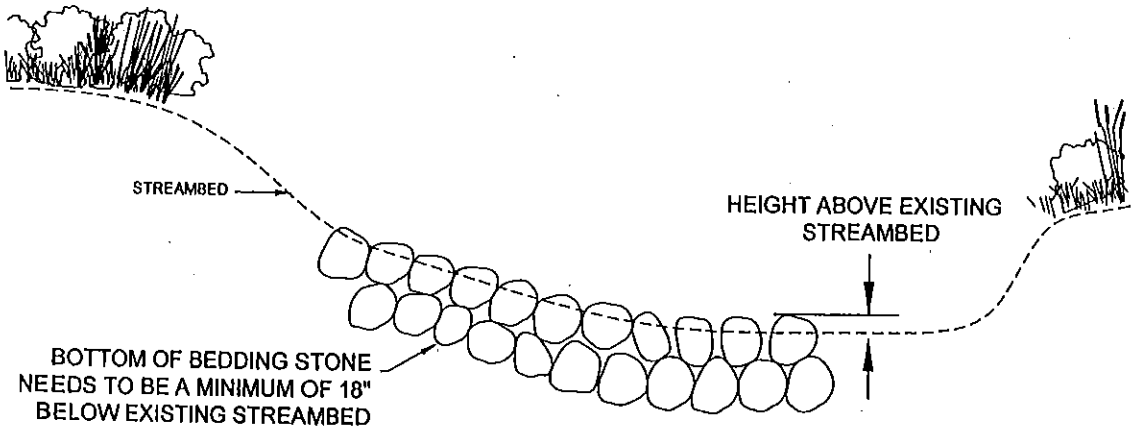


J-hook-Vane in Carrier Creek, Eaton County

Source: Wetland and Coastal Resources and the Eaton County Drain Commissioner, Brady Harrington



PLAN VIEW



CROSS-SECTION A-A

Source: Adapted from Rosgen, D.L., J Hook and Cross Vane, ASCE Wetland and Stream Restoration Conference 2001, Reno, NV.

SECTION 8

Part 91 and Administrative Rules

Please go the following websites to print the most current version of Part 91 and the Administrative Rules:

PART 91, Soil Erosion and Sedimentation Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended

For a printer friendly version of the statute all in one document, go to the following link and click on the printer icon on the upper right hand corner of the screen. A new window will appear—click on the "PDF Version" icon.

www.legislature.mi.gov/(5cwjy0u0cpxld2u0prdn5pvy)/mileg.aspx?page=GetMCLDocument&objectname=mcl-451-1994-II-2-Soil-Conservation-Erosion-and-sedimentation-Control-91

ADMINISTRATIVE RULES

http://www.state.mi.us/orr/emi/admincode.asp?AdminCode=Single&Admin_Num=323017O1

For additional information visit the DEQ Soil Erosion and Sedimentation Control Program Website at:

http://www.mi.gov/deq/0,1607,7-135-3311_4113---,00.html

SECTION 9

Glossary

GLOSSARY

_CDC _____ County Drain Commissioner

Accelerated soil erosion means the increased loss of the land surface that occurs as a result of human activities.

Agricultural Practices means all land farming operations except plowing or tilling of land for the purpose of crop production or the harvesting of crops.

APA is an acronym for Authorized Public Agency

Authorized Public Agency (APA) means a state agency or an agency of a local unit of government authorized by the MDEQ under Section 9110 of Part 91 to implement soil erosion and sedimentation control procedures with regard to earth changes undertaken by it.

Backwater means the increased depth of water upstream of a restriction or obstruction, such as a dam, bridge or culvert.

Base Flow means the portion of stream flow that is not due to runoff from precipitation, usually supported by water seepage from natural storage areas such as groundwater, a waterbody or wetlands.

Bulkhead means a plug installed in a sewer pipe constructed of concrete, brick, or masonry to block to prevent flow into or out of a conveyance system.

Certified Storm Water Operator means a person who has a valid Storm Water Operator for Construction Sites Certification from the MDEQ.

Conservation District (CD) means a conservation district authorized under Part 93, Soil Conservation Districts, of the Natural Resources and Environmental Protection Act, 1994 PA 451, being 324.9301 *et.seq.* of the Michigan Compiled Laws.

County means the County of _____, Michigan.

County Enforcing Agency (CEA) means the _____ County Drain Commissioner's Office, as designated by the Branch County Board of Commissioners under Section 9105 of Part 91.

Discharge means the volume of water passing a point in a given time and is often expressed as cubic feet per second.

Earth Change means a human-made change in the natural cover or topography of land, including cut and fill activities, which may result in or contribute to soil erosion or sedimentation of the Waters of the State. Earth change does not include the practice of plowing and tilling soil for the purpose of crop production. Earth change does include digging in the ditch, grubbing, leveling spoils, stump removal, deposition of spoils, laying back slopes, culvert replacement, placement of riprap, armoring a drain bank.

Earth Change Permit or **Permit** means an earth change permit issued by a County Enforcing Agency or a Municipal Enforcing Agency authorizing work to be performed under the provisions of Part 91, the Rules, or a local SESC ordinance.

Engineer means a person, firm or corporation providing professional engineering design expertise to the _CDC.

Forebay means a small, separate storage area near the inlet to a stormwater or sediment basin, used to trap and settle incoming sediments before they enter the basin.

Geotextile fabric means non-woven geotextile filter fabric.

Grading means any leveling, stripping, excavating, filling, stockpiling or any combination thereof and shall include the land in its excavated or filled condition.

Grubbing means the removal of tree stumps and roots from below ground.

Harmful Interference means causing an unnaturally high stage or unnatural direction of flow on a river or stream that causes, or may cause, damage to property, a threat to life, a threat of personal injury, or a threat to water resources.

Lake means the Great Lakes and all natural and artificial inland lakes or impounds that have definite banks, a bed, visible evidence of continued occurrence of water, and a surface area of water that is equal to, or greater than 1 acre. Lake does not include sediment basins and basins constructed for the sole purpose of storm water retention, cooling water, or treating polluted water.

Landowner means the person who owns or holds a recorded easement on the property or who is engaged in construction in a public right-of-way in accordance with sections 13, 14, 15, and 16 of Highway Obstructions and Encroachments; use of Highway by Public Utilities, 1925 PA 368, as amended, being 247.183, 247.184, 247.185, and 247.186 of the Michigan Compiled Laws.

Live stake means a stake made from acceptable species; live, rootable, vegetative cuttings inserted into the ground.

MDEQ is an acronym for the Michigan Department of Environmental Quality.

Timber means trees having a stump diameter of 6 inches or more.

Municipal Enforcing Agency (MEA) means an agency designated by a municipality under Section 9106 of Part 91 to enforce a Local Ordinance that has been approved by the MDEQ.

Municipality means any of the following:

a. A city.
b. A village.
c. A charter township.
d. A general law township that is located in a county with a population of 200,000 or more.

Non-erosive velocity means a speed of water movement that is not conducive to the development of accelerated soil erosion.

NPDES is an acronym for the National Pollutant Discharge Elimination System.

Ordinary High Water Mark means the line between upland and bottomland that persists through successive changes in water levels, below which the presence and action of the water is so common or recurrent that the character of the land is marked distinctly from the upland and is apparent in the soil itself, the configuration of the surface of the soil, and the vegetation. On an inland lake that has a level established by law, it means the high established level. Where water returns to its natural level as the result of the permanent removal or abandonment of a dam, it means the natural ordinary high-water mark.

Part 91 means Part 91, Soil Erosion and Sedimentation Control, of the Michigan Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, being 324.9101 *et seq.* of the Michigan Compiled Laws.

Permanent Soil Erosion and Sedimentation Control Measures means those control measures, which are installed or constructed to control soil erosion and sedimentation and which are maintained after project completion.

Piping is when seepage is transporting soil.

Plunge pool means a deep pool into which water falls that is provided for energy dissipation.

Point bars means ridges of deposited material located in the streambed.

Rules means the rules promulgated pursuant to the Administrative Procedures Act of 1969, 1969 PA 306, being 24.201 to 24.328 of the Michigan Compiled Laws for the administration of Part 91.

Runoff means the excess portion of precipitation that does not infiltrate into the ground, but runs off and reaches a stream, waterbody, or storm sewer.

Sediment means solid particulate matter, including both mineral and organic matter, that is in suspension in water, is being transported, or has been removed from its site of origin by the actions of wind, water, or gravity and has been deposited elsewhere.

Sediment Basin means a naturally occurring or constructed depression used for the sole purpose of capturing sediment during and after an earth change activity.

Sheet Flow means runoff which flows over the ground surface as a thin, even layer, not concentrated in a channel.

Site means the location at which the work is to be performed.

Soft armor means installation of a vegetated erosion protection by such methods as live staking or brush blankets.

Soil Erosion means the wearing away of land by the action of wind, water, or gravity; or a combination of wind, water, or gravity.

Stabilization means the establishment of vegetation or the proper placement, grading, or covering of soil to ensure its resistance to soil erosion, sliding, or other earth movement.

State Agency means a principal state department or a state public university.

Stilling Basin means a short length of paved channel generally placed at the foot of a spillway to dissipate energy before the flow reaches the exposed and unpaved riverbed downstream.

Storm Water Retention Basin means an area which is constructed to capture surface water runoff and which does not discharge directly to a lake or stream through an outlet. Water leaves the basin by infiltration and evaporation.

Stream as defined by Part 301, Inland Lakes and Streams of the NREPA, means a natural or artificial river, stream, or creek which may or may not be serving as a drain as defined by the drain code of 1956, 1956 PA 40, that has definite banks, a bed, and visible evidence of a continued flow or continued occurrence of water (intermittent flow), including the St. Marys, St. Clair, and Detroit Rivers.

Stream as defined by Part 91, Soil Erosion and Sedimentation Control, of the NREPA, means a river, creek, or other surface watercourse which may or may not be serving as a drain as defined in The Drain Code of 1956, 1956 PA 40, as amended, being 280.1 *et seq.* of the Michigan Compiled Laws, and which has definite banks, a bed, and visible evidence of the continued flow or continued occurrence of water, including the connecting waters of the Great Lakes.

Swale means a natural depression or wide shallow ditch used to temporarily or permanently convey, store, or filter runoff.

Tailwater means the depth or elevation of water at the downstream end of a structure, such as a bridge, culvert or dam.

Temporary Soil Erosion and Sedimentation Control Measures means interim control measures which are installed or constructed to control soil erosion and sedimentation and which are not maintained after project completion.

Violation of Part 91 or **Violates Part 91** means a violation of Part 91, or the Rules.

Waters of the State means the Great Lakes and their connecting waters, inland lakes and streams, as defined in the Rules, and wetlands regulated under Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, being 324.30301 *et seq.* of the Michigan Compiled Laws.

Weather Resistant Stone means stone that will not absorb water that would freeze and then crack the stone.

Weir means a structure that extends across the width of a channel, and is used to impound, measure, or in some way alter the channel flow. Weirs are often constructed of concrete or sheet piling.

DEPARTMENT OF ENVIRONMENTAL QUALITY

LAND AND WATER MANAGEMENT DIVISION

(By authority conferred on the water resources commission by sections 2 and 5 of Act No. 245 of the Public Acts of 1929, as amended, sections 33 and 63 of Act No. 306 of the Public Acts of 1969, as amended, and Executive Order No. 1976-8a, being SS323.2, 323.5, 24.233, and 24.263 of the Michigan Compiled Laws)

PART 17. SOIL EROSION AND SEDIMENTATION CONTROL

R 323.1701 Definitions.

Rule 1701. (1) As used in this part:

(a) "Accelerated soil erosion" means the increased loss of the land surface that occurs as a result of human activities.

(b) "Acceptable erosion and sediment control program" means the activities of a county or local enforcing agency or authorized public agency that are conducted in accordance with these rules and part 91 regarding staff training, developing and reviewing plans, issuing permits, conducting inspections, and initiating compliance and enforcement actions to effectively minimize erosion and off-site sedimentation.

(c) "Designated agent" means a person who has written authorization from the landowner to sign the application and secure a permit in the landowner's name.

(d) "Lake" means the Great Lakes and all natural and artificial inland lakes or impoundments that have definite banks, a bed, visible evidence of a continued occurrence of water, and a surface area of water that is equal to, or greater than, 1 acre. "Lake" does not include sediment basins and basins constructed for the sole purpose of storm water retention, cooling water, or treating polluted water.

(e) "Landowner" means the person who owns or holds a recorded easement on the property or who is engaged in construction in a public right-of-way in accordance with sections 13, 14, 15, and 16 of Act No. 368 of the Public Acts of 1925, as amended, being $$247.183, 247.184, 247.185, and 247.186 of the Michigan Compiled Laws.

(f) "Nonerosive velocity" means a speed of water movement that is not conducive to the development of accelerated soil erosion.

(g) "Part 91" means part 91 of Act No. 451 of the Public Acts of 1994, as amended, being $$324.9101 to 324.9123 of the Michigan Compiled Laws.

(h) "Sediment basin" means a naturally occurring or constructed depression used for the sole purpose of capturing sediment during or after an earth change activity.

(i) "Stabilization" means the establishment of vegetation or the proper placement, grading, or covering of soil to ensure its resistance to soil erosion, sliding, or other earth movement.

(j) "Storm water retention basin" means an area which is constructed to capture surface water runoff and which does not discharge directly to a lake or stream through an outlet. Water leaves the basin by infiltration and evaporation.

(k) "Stream" means a river, creek, or other surface watercourse which may or may not be serving as a drain as defined in Act No. 40 of the Public Acts of 1956, as amended, being §280.1 et seq. of the Michigan Compiled Laws, and which has definite banks, a bed, and visible evidence of the continued flow or continued occurrence of water, including the connecting waters of the Great Lakes.

(l) "Temporary soil erosion and sedimentation control measures" means interim control measures which are installed or constructed to control soil erosion and sedimentation and which are not maintained after project completion.

(m) "Permanent soil erosion and sedimentation control measures" means control measures which are installed or constructed to control soil erosion and sedimentation and which are maintained after project completion.

(2) The terms defined in part 91 have the same meanings when used in these rules.

History: 1954 ACS 81, Eff. Jan. 1, 1975; 1979 AC; 1998 MR 7, Eff. July 15, 1998.

R 323.1702 Earth change requirements generally.

Rule 1702. (1) A person shall conduct an earth change in a manner that will effectively reduce accelerated soil erosion and resulting sedimentation.

(2) A person engaged in an earth change identified in R 323.1704 shall plan, implement, and maintain acceptable soil erosion and sedimentation control measures in conformance with part 91, which effectively reduce accelerated soil erosion and off-site sedimentation.

(3) A person shall set forth soil erosion and sedimentation control measures in a plan as prescribed by R 323.1703. A person shall make the plan available for inspection at all times at the site of the earth change. The department, or its designated representative, may require the county or local enforcing agency to file a copy of the plan with the department.

(4) A person shall obtain a permit containing state prescribed information, as required by R 323.1707, and make the permit available for inspection at the site of the earth change.

History: 1954 ACS 81, Eff. Jan. 1, 1975; 1979 AC; 1998 MR 7, Eff. July 15, 1998.

R 323.1703 Soil erosion and sedimentation control plan requirements.

Rule 1703. A person shall prepare a soil erosion and sedimentation control plan for any earth change identified in R 323.1704. A person shall design the plan to effectively reduce accelerated soil erosion and sedimentation and shall identify factors that may contribute to soil erosion or sedimentation, or both. The plan shall include, but not be limited to, all of the following:

(a) A map or maps at a scale of not more than 200 feet to the inch or as otherwise determined by the county or local enforcing agency. A map shall include a legal description and site location sketch that includes the proximity of any proposed earth change to lakes or streams, or both; predominant land features; and contour intervals or slope description.

(b) A soils survey or a written description of the soil types of the exposed land area contemplated for the earth change.

(c) Details for proposed earth changes, including all of the

following:
(i) A description and the location of the physical limits of each proposed earth change.
(ii) A description and the location of all existing and proposed on-site drainage and dewatering facilities.
(iii) The timing and sequence of each proposed earth change.
(iv) The location and description for installing and removing all proposed temporary soil erosion and sediment control measures.
(v) A description and the location of all proposed permanent soil erosion and sediment control measures.
(vi) A program proposal for the continued maintenance of all permanent soil erosion and sediment control measures that remain after project completion, including the designation of the person responsible for the maintenance. Maintenance responsibilities shall become a part of any sales or exchange agreement for the land on which the permanent soil erosion control measures are located.

History: 1954 ACS 81, Eff. Jan. 1, 1975; 1979 AC; 1998 MR 7, Eff. July 15, 1998.

R 323.1704 Permit requirements.
Rule 1704. (1) A landowner or designated agent who contracts for, allows, or engages in, an earth change in this state shall obtain a permit from the appropriate enforcing agency before commencing an earth change which disturbs 1 or more acres of land or which is within 500 feet of the water's edge of a lake or stream, unless exempted in R 323.1705.
(2) An earth change activity that does not require a permit under subrule (1) of this rule is not exempt from enforcement procedures under part 91 or these rules, if the activity exempted by subrule (1) of this rule causes or results in a violation of part 91 or these rules.

History: 1954 ACS 81, Eff. Jan. 1, 1975; 1979 AC; 1998 MR 7, Eff. July 15, 1998.

R 323.1705 Permit exemptions and waivers.
Rule 1705. (1) A permit is not required for any of the following:
(a) A beach nourishment project permitted under part 325 of Act No. 451 of the Public Acts of 1994, as amended, being § 324.32501 et seq. of the Michigan Compiled Laws.
(b) Normal road and driveway maintenance, such as grading or leveling, that does not increase the width or length of the road or driveway and that will not contribute sediment to lakes or streams.
(c) An earth change of a minor nature that is stabilized within 24 hours of the initial earth disturbance and that will not contribute sediment to lakes or streams
(d) Installation of oil, gas, and mineral wells under permit from the supervisor of wells if the owner-operator is found by the supervisor of wells to be in compliance with the conditions of part 91.
(2) A county or local enforcing agency may grant a permit waiver for an earth change after receiving a signed affidavit from the landowner stating that the earth change will disturb less than 225 square feet and that the earth change will not contribute sediment to lakes or streams.
(3) Exemptions provided in subrules (1) and (2) of this rule shall not be construed as exemptions from enforcement procedures under part 91 or these rules, if the activities exempted by subrules (1) and (2) cause or result in a violation of part 91 or these rules.

History: 1954 ACS 81, Eff. Jan. 1, 1975; 1979 AC; 1998 MR 7, Eff. July 15, 1998.

R 323.1706 Application for permit.

Rule 1706. (1) A landowner or designated agent shall submit an application for a permit to the appropriate enforcing agency.

(2) A landowner or designated agent shall submit, with the application, a soil erosion and sedimentation control plan and any other document that the appropriate enforcing agency may require.

(3) The county or local enforcing agency shall provide an application requiring state prescribed information to an applicant.

(4) An authorized public agency is exempt from obtaining a permit from a county or local enforcing agency, but shall notify the county or local enforcing agency of each proposed earth change.

History: 1954 ACS 81, Eff. Jan. 1, 1975; 1979 AC; 1998 MR 7, Eff. July 15, 1998.

R 323.1707 Application review and permit procedures.

Rule 1707. (1) A person who is designated by the county or local enforcing agency and who is trained in soil erosion and sedimentation control methods and techniques shall review and approve a soil erosion and sedimentation control plan.

(2) The appropriate enforcing agency shall approve, disapprove, or require modification of an application for an earth change permit within 30 calendar days following receipt of the application. The enforcing agency shall notify an applicant of approval by first-class mail. If an application is disapproved, then the enforcing agency shall advise the applicant by certified mail of its reasons for disapproval and conditions required for approval. The enforcing agency need not notify an applicant of approval or disapproval by mail if the applicant is given written approval or disapproval of the application in person. A permit given to the applicant either in person or by first-class mail constitutes approval.

(3) If an earth change is under the jurisdiction of 2 or more local or county enforcing agencies, then the department shall act as the enforcing agency.

(4) A permit that contains state-prescribed information shall be used by each county or local enforcing agency and shall include any additional provisions required by the county or local enforcing agency. The permit shall be available at the site of the earth change for inspection.

(5) Upon a determination that a permit applicant has met all of the requirements of these rules, part 91, and the local ordinance, if applicable, the appropriate enforcing agency shall issue a permit for the proposed earth change.

History: 1954 ACS 81, Eff. Jan. 1, 1975; 1979 AC; 1998 MR 7, Eff. July 15, 1998.

R 323.1708 Soil erosion and sedimentation control procedures and measures generally.

Rule 1708. A person who applies for an earth change permit shall incorporate the soil erosion and sedimentation control procedures and measures prescribed by R 323.1709 and R 323.1710 into the soil erosion and sedimentation control plan and shall apply the procedures and measures to

all earth changes identified in the plan, unless the person preparing the plan shows, to the satisfaction of the appropriate enforcing agency, that altering the control procedures or measures or including other control procedures or measures will prevent accelerated soil erosion and sedimentation during the earth change.

History: 1954 ACS 81, Eff. Jan. 1, 1975; 1979 AC; 1998 MR 7, Eff. July 15, 1998.

R 323.1709 Earth change requirements: time; sediment removal; design, installation, and removal of temporary or permanent control measures.

Rule 1709. (1) A person shall design, construct, and complete an earth change in a manner that limits the exposed area of any disturbed land for the shortest possible period of time as determined by the county or local enforcing agency.

(2) A person shall remove sediment caused by accelerated soil erosion from runoff water before it leaves the site of the earth change.

(3) A person shall design a temporary or permanent control measure that is designed and constructed for the conveyance of water around, through, or from the earth change area to limit the water flow to a nonerosive velocity.

(4) A person shall install temporary soil erosion and sedimentation control measures before or upon commencement of the earth change activity and shall maintain the measures on a daily basis. A person shall remove temporary soil erosion and sedimentation control measures after permanent soil erosion measures are in place and the area is stabilized. A person shall stabilize the area with permanent soil erosion control measures under approved standards and specifications as prescribed by R 323.1710.

(5) A person shall complete permanent soil erosion control measures for all slopes, channels, ditches, or any disturbed land area within 5 calendar days after final grading or the final earth change has been completed. If it is not possible to permanently stabilize a disturbed area after an earth change has been completed or if significant earth change activity ceases, then a person shall maintain temporary soil erosion and sedimentation control measures until permanent soil erosion control measures are in place and the area is stabilized.

History: 1954 ACS 81, Eff. Jan. 1, 1975; 1979 AC; 1998 MR 7, Eff. July 15, 1998.

R 323.1710 Standards and specifications.

Rule 1710. A person shall complete all temporary and permanent erosion and sedimentation control measures according to the approved plan or operating procedures.

(1) A person shall install and maintain control measures in accordance with the standards and specifications of all of the following:

(a) The product manufacturer.

(b) The local conservation district.

(c) The department.

(d) The Michigan department of transportation.

(e) The enforcing agency, if applicable and formally adopted.

(2) If a conflict exists between the standards and specifications, then the enforcing agency or authorized public agency shall determine which specifications are appropriate for the project.

History: 1954 ACS 81, Eff. Jan. 1, 1975; 1979 AC; 1998 MR 7, Eff. July

15, 1998.

R 323.1711 Building permits.

Rule 1711. (1) A local agency or general law township that issues building permits shall notify the county or local enforcing agency immediately upon receipt of an application for a building permit that requires an earth change which disturbs 1 or more acres or which is located within 500 feet of a lake or stream.

(2) A local agency or general law township shall not issue a building permit to a person engaged in an earth change if the change requires a permit under part 91 or these rules until the county or local enforcing agency has issued the required state-prescribed permit for the earth change.

History: 1954 ACS 81, Eff. Jan. 1, 1975; 1979 AC; 1998 MR 7, Eff. July 15, 1998.

R 323.1712 Enforcement.

Rule 1712. The county or local enforcing agency may issue a cease and desist order or revoke a permit upon its finding that there is a violation of part 91, these rules, or an approved local ordinance or a finding that there is a violation of a permit or an approved soil erosion and sedimentation control plan.

History: 1954 ACS 81, Eff. Jan. 1, 1975; 1979 AC; 1998 MR 7, Eff. July 15, 1998.

R 323.1713 Periodic review.

Rule 1713. The department shall conduct an ongoing comprehensive review and evaluation of all soil erosion and sedimentation control programs that operate under part 91 and these rules. The department shall notify county and local enforcing agencies and authorized public agencies as to the acceptability of their soil erosion and sedimentation control programs. The department shall make available a report of its findings of the review and evaluation of all enforcing agencies and authorized public agencies.

History: 1954 ACS 81, Eff. Jan. 1, 1975; 1979 AC; 1998 MR 7, Eff. July 15, 1998.

R 323.1714 Availability of documents.

Rule 1714. Copies of the local conservation district standards and specifications for soil erosion and sedimentation control, as referred to in R 323.1710, are available at each local conservation district office at a nominal cost. Copies of the department's standards are available from the surface water quality division's Lansing office. Department of transportation standards are available at the Lansing office for a fee. Information on other standards may be available from product manufacturers and the enforcing agencies.

History: 1954 ACS 81, Eff. Jan. 1, 1975; 1979 AC; 1998 MR 7, Eff. July 15, 1998.

PART 91, SOIL EROSION AND SEDIMENTATION CONTROL
OF THE
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION ACT
1994 PA 451, AS AMENDED

(Includes all amendments through 8-1-05)

324.9101 Definitions; A to W.

Sec. 9101. (1) "Agricultural practices" means all land farming operations except the plowing or tilling of land for the purpose of crop production or the harvesting of crops.

(2) "Authorized public agency" means a state agency or an agency of a local unit of government authorized under section 9110 to implement soil erosion and sedimentation control procedures with regard to earth changes undertaken by it.

(3) "Conservation district" means a conservation district authorized under part 93.

(4) "Consultant" means either of the following:

(a) An individual who has a current certificate of training under section 9123.

(b) A person who employs 1 or more individuals who have current certificates of training under section 9123.

(5) "County agency" means an officer, board, commission, department, or other entity of county government.

(6) "County enforcing agency" means a county agency or a conservation district designated by a county board of commissioners under section 9105.

(7) "County program" or "county's program" means a soil erosion and sedimentation control program established under section 9105.

(8) "Department" means the department of environmental quality.

(9) "Earth change" means a human-made change in the natural cover or topography of land, including cut and fill activities, which may result in or contribute to soil erosion or sedimentation of the waters of the state. Earth change does not include the practice of plowing and tilling soil for the purpose of crop production.

(10) "Gardening" means activities necessary to the growing of plants for personal use, consumption, or enjoyment.

(11) "Local ordinance" means an ordinance enacted by a local unit of government under this part providing for soil erosion and sedimentation control.

(12) "Municipal enforcing agency" means an agency designated by a municipality under section 9106 to enforce a local ordinance.

(13) "Municipality" means any of the following:

(a) A city.

(b) A village.

(c) A charter township.

(d) A general law township that is located in a county with a population of 200,000 or more.

(14) "Rules" means the rules promulgated pursuant to the administrative procedures act of 1969, 1969 PA 306, MCL 24.201 to 24.328.

(15) "Seawall maintenance" means an earth change activity landward of the seawall.

(16) "Sediment" means solid particulate matter, including both mineral and organic matter, that is in suspension in water, is being transported, or has been removed from its site of origin by the actions of wind, water, or gravity and has been deposited elsewhere.

(17) "Soil erosion" means the wearing away of land by the action of wind, water, gravity, or a combination of wind, water, or gravity.

(18) "State agency" means a principal state department or a state public university.

(19) "Violation of this part" or "violates this part" means a violation of this part, the rules promulgated under this part, a permit issued under this part, or a local ordinance enacted under this part.

(20) "Waters of the state" means the Great Lakes and their connecting waters, inland lakes and streams as defined in rules promulgated under this part, and wetlands regulated under part 303.

History: Add. 1995, Act 60, Imd. Eff. May 24, 1995 ;-- Am. 2000, Act 504, Imd. Eff. Jan. 11, 2001 ;-- Am. 2001, Act 227, Imd. Eff. Jan. 2, 2002 ;-- Am. 2005, Act 55, Imd. Eff. June 30, 2005

324.9102, 324.9103 Repealed. 2000, Act 504, Imd. Eff. Jan. 11, 2001.

Compiler's Notes: The repealed sections pertained to definitions and soil erosion and sedimentation control program.

324.9104 Rules; availability of information.

Sec. 9104. (1) The department, with the assistance of the department of agriculture, shall promulgate rules for a unified soil erosion and sedimentation control program, including provisions for the review and approval of site plans, land use plans, or permits relating to soil erosion control and sedimentation control. The department shall notify and make copies of proposed rules available to county enforcing agencies, municipal enforcing agencies, and authorized public agencies for review and comment before promulgation.

(2) The department shall make available to county enforcing agencies, municipal enforcing agencies, and authorized public agencies educational information on soil erosion and sedimentation control techniques and the benefits of implementing soil erosion and sedimentation control measures. County enforcing agencies and municipal enforcing agencies shall distribute this information to persons receiving permits under a county program or a local ordinance and to other interested persons.

History: Add. 1995, Act 60, Imd. Eff. May 24, 1995 ;-- Am. 2000, Act 504, Imd. Eff. Jan. 11, 2001

324.9105 Administration and enforcement of rules; resolution; ordinance; interlocal agreement; review; notice of results; informal meeting; probation; consultant; inspection fees; rescission of order, stipulation, or probation.

Sec. 9105. (1) Subject to subsection (6), a county is responsible for the administration and enforcement of this part and the rules promulgated under this part throughout the county except as follows:

(a) Within a municipality that has assumed the responsibility for soil erosion and sedimentation control under section 9106.

(b) With regard to earth changes of authorized public agencies.

(2) Subject to subsection (3), the county board of commissioners of each county, by resolution, shall designate a county agency, or a conservation district upon the concurrence of the conservation district, as the county enforcing agency responsible for administration and enforcement of this part and the rules promulgated under this part in the name of the county. The resolution may set forth a schedule of fees for inspections, plan reviews, and permits and may set forth other matters relating to the administration and enforcement of the county program and this part and the rules promulgated under this part.

(3) In lieu of or in addition to a resolution provided for in subsection (2), the county board of commissioners of a county may provide by ordinance for soil erosion and sedimentation control in the county. An ordinance adopted under this subsection may be more restrictive than, but shall not make lawful that which is unlawful under, this part and the rules promulgated under this part. If an ordinance adopted under this subsection is more restrictive than this part and the rules promulgated under this part, the county enforcing agency shall notify a person receiving a permit under the ordinance that the ordinance is more restrictive than this part and the rules promulgated under this part. The ordinance shall incorporate by reference the rules promulgated under this part that do not conflict with a more restrictive ordinance and may set forth such other matters as the county board of commissioners considers necessary or desirable. The ordinance may provide penalties for a violation of the ordinance that are consistent with section 9121.

(4) A copy of a resolution or ordinance adopted under this section and all subsequent amendments to the resolution or ordinance shall be forwarded to the department for the department's review and approval. The department shall forward a copy to the conservation district for that county for review and comment.

(5) Two or more counties may provide for joint enforcement and administration of this part and the rules promulgated under this part by entering into an interlocal agreement pursuant to the urban cooperation act of 1967, 1967 (Ex Sess) PA 7, MCL 124.501 to 124.512.

(6) The department shall conduct a review of a county's program every 5 years. The review shall be conducted at least 6 months before the expiration of each succeeding 5-year period. The department shall approve a county's program if all of the following conditions are met:

(a) The county has passed a resolution or enacted an ordinance as provided in this section.

(b) The individuals with decision-making authority who are responsible for administering the county program have current certificates of training under section 9123.

(c) The county has effectively administered and enforced the county program in the past 5 years or has implemented changes in its administration or enforcement procedures that the department determines will result in the county effectively administering and enforcing the county program. In determining whether the county has met the requirement of this subdivision, the department shall consider all of the following:

(i) Whether a mechanism is in place to provide funding to administer the county's program.

(ii) Whether the county has conducted adequate inspections to assure minimization of soil erosion and off-site sedimentation.

(iii) The effectiveness of the county's past compliance and enforcement efforts.

(iv) The adequacy and effectiveness of the applications and soil erosion and sedimentation control plans being accepted by the county.

(v) The adequacy and effectiveness of the permits issued by the county and the inspections being performed by the county.

(vi) The conditions at construction sites under the jurisdiction of the county as documented by departmental inspections.

(7) Following a review under subsection (6), the department shall notify the county of the results of its review and whether the department proposes to approve or disapprove the county's program. Within 30 days of receipt of the notice under this subsection, a county may request and the department shall hold an informal meeting to discuss the review and the proposed action by the department.

(8) Following the meeting under subsection (7), if requested, and consideration of the review under subsection (6), if the department does not approve a county's program, the department shall enter an order, stipulation, or consent agreement under section 9112(7) placing the county on probation. In addition, at any time that the department determines that a county that was previously approved by the department under subsection (6) is not satisfactorily administering and enforcing the county's program, the department shall enter into an order, stipulation, or consent agreement under section 9112(7) placing the county on probation. During the 6-month period after a county is placed on probation, the department shall consult with the county on how the county could change its administration of the county program in a manner that would result in its approval.

(9) Within 6 months after a county has been placed on probation under subsection (8), the county may notify the department that it intends to hire a consultant to administer the county's program. If, within 60 days after notifying the department, the county hires a consultant that is acceptable to the department, then within 1 year after the county hires the consultant, the department shall conduct a review of the county's program to determine whether or not the county program can be approved.

(10) If any of the following occur, the department shall hire a consultant to administer the county's program:

(a) The county does not notify the department of its intent to hire a consultant under subsection (9).

(b) The county does not hire a consultant that is acceptable to the department within 60 days after notifying the department of its intent to hire a consultant under subsection (9).

(c) The county remains unapproved following the department's review under subsection (9).

(11) Upon hiring a consultant under subsection (10), the department may establish a schedule of fees for inspections, review of soil erosion and sedimentation control plans, and permits for the county's program that will provide sufficient revenues to pay for the cost of the contract with the consultant, or the department may bill the county for the cost of the contract with the consultant. As used in this subsection, "cost of the contract" means the actual cost of a contract with a consultant plus the documented costs to the department in administering the contract, but not to exceed 10% of the actual cost of the contract.

(12) At any time that a county is on probation as provided for in this section, the county may request the department to conduct a review of the county's program. If, upon such review, the county has implemented appropriate changes to the county's program, the department shall approve the county's program. If the department approves a county's program under this subsection, the department shall rescind its order, stipulation, or consent agreement that placed the county on probation.

History: Add. 1995, Act 60, Imd. Eff. May 24, 1995 ;-- Am. 2000, Act 504, Imd. Eff. Jan. 11, 2001 ;-- Am. 2005, Act 55, Imd. Eff. June 30, 2005

324.9106 Ordinances.

Sec. 9106. (1) Subject to subsection (3), a municipality by ordinance may provide for soil erosion and sedimentation control on public and private earth changes within its boundaries except that a township ordinance shall not be applicable within a village that has in effect such an ordinance. An ordinance may be more restrictive than, but shall not make lawful that which is unlawful under, this part and the rules promulgated under this part. If an ordinance adopted under this section is more restrictive than this part and the rules promulgated under this part, the municipal enforcing agency shall notify a person receiving a permit under the ordinance that the ordinance is more restrictive than this part and the rules promulgated under this part. The ordinance shall incorporate by reference the rules promulgated under this part that do not conflict with a more restrictive ordinance, shall designate a municipal enforcing agency responsible for administration and enforcement of the ordinance, and may set forth such other matters as the legislative body considers necessary or desirable. The ordinance shall be applicable and shall be enforced with regard to all private and public earth changes within the municipality except earth changes by an authorized public agency. The municipality may consult with a conservation district for assistance or advice in the preparation of the ordinance. The ordinance may provide penalties for a violation of the ordinance that are consis tent with section 9121.

(2) An ordinance related to soil erosion and sedimentation control that is not approved by the department as conforming to the minimum requirements of this part and the rules promulgated under this part has no force or effect. A municipality shall submit a copy of its proposed ordinance or of a proposed amendm ent to its ordinance to the department for approval before adoption. The department shall forward a copy to the county enforcing agency of the county in which the municipality is located and the appropriate conservation district for review and comment. Within 90 days after the department receives an existing ordinance, proposed ordinance, or amendment, the department shall notify the clerk of the municipality of its approval or disapproval along with recommendations for revision if the ordinance, proposed ordinance, or amendment does not conform to the minimum requirements of this part or the rules promulgated under this part. If the department does not notify the clerk of the local unit within the 90-day period, the ordinance, proposed ordinance, or amendment shall be considered to have been approved by the department.

(3) A municipality shall not administer and enforce this part or the rules promulgated under this part or a local ordinance unless the department has approved the municipality. An approval under this section is valid for 5 years, after which the department shall review the municipality for reapproval. At least 6 months before the expiration of each succeeding 5-year approval period, the department shall complete a review of the municipality for reapproval. The department shall approve a municipality if all of the following conditions are met:

(a) The municipality has enacted an ordinance as provided in this section that is at least as restrictive as this part and the rules promulgated under this part.

(b) The individuals with decision-making authority who are responsible for administering the soil erosion and sedimentation control program for the municipality have current certificates of training under section 9123.

(c) The municipality has submitted evidence of its ability to effectively administer and enforce a soil erosion and sedimentation control program. In determining whether the municipality has met the requirements of this subdivision, the department shall consider all of the following:

(i) Whether a mechanism is in place to provide funding to administer the municipality's soil erosion and sedimentation control program.

(ii) The adequacy of the documents proposed for use by the municipality including, but not limited to, application forms, soil erosion and sedimentation control plan requirements, permit forms, and inspection reports.

(iii) If the municipality has previously administered a soil erosion and sedimentation control program, whether the municipality effectively administered and enforced the program in the past or has implemented changes in its administration or enforcement procedures that the department determines will result in the municipality effectively administering and enforcing a soil erosion and sedimentation control program in compliance with this part and the rules promulgated under this part. In determining whether the municipality has met the requirement of this subparagraph, the department shall consider all of the following:

(A) Whether the municipality has had adequate funding to administer the municipality's soil erosion and sedimentation control program.

(B) Whether the municipality has conducted adequate inspections to assure minimization of soil erosion and off-site sedimentation.

(C) The effectiveness of the municipality's past compliance and enforcement efforts.

(D) The adequacy and effectiveness of the applications and soil erosion and sedimentation control plans being accepted by the municipality.

(E) The adequacy and effectiveness of the permits issued by the municipality and the inspections being performed by the municipality.

(F) The conditions at construction sites under the jurisdiction of the municipality as documented by departmental inspections.

(4) If the department determines that a municipality is not approved under subsection (3) or that a municipality that was previously approved under subsection (3) is not satisfactorily administering and enforcing this part and the rules promulgated under this part, the department shall enter an order, stipulation, or consent agreement under section 9112(7) denying the municipality authority or revoking the municipality's authority to administer a soil erosion and sedimentation control program. Upon entry of this order, stipulation, or consent agreement, the county program for the county in which the municipality is located becomes operative within the municipality.

(5) A municipality that elects to rescind its ordinance shall notify the department. Upon rescission of its ordinance, the county program for the county in which the municipality is located becomes operative within the municipality.

(6) A municipality that rescinds its ordinance or is not approved by the department to administer the program shall retain jurisdiction over projects under permit at that time. The municipality shall retain jurisdiction until the projects are completed and stabilized or the county agrees to assume jurisdiction over the permitted earth changes.

History: Add. 1995, Act 60, Imd. Eff. May 24, 1995 ;-- Am. 2000, Act 504, Imd. Eff. Jan. 11, 2001 ;-- Am. 2005, Act 55, Imd. Eff. June 30, 2005

324.9107 Notice of violation.

Sec. 9107. If a local unit of government has notice that a violation of this part has occurred within the boundaries of that local unit of government, including but not limited to a violation attributable to an earth change by an authorized public agency, the local unit of government shall notify the appropriate county enforcing agency and municipal enforcing agency and the department of the violation.

History: Add. 1995, Act 60, Imd. Eff. May 24, 1995 ;-- Am. 2000, Act 504, Imd. Eff. Jan. 11, 2001

324.9108 Permit; deposit as condition for issuance.

Sec. 9108. As a condition for the issuance of a permit, the county enforcing agency or municipal enforcing agency may require the applicant to deposit with the clerk of the county or municipality in the form of cash, a certified check, or an irrevocable bank letter of credit, whichever the applicant selects, or a surety bond acceptable to the legislative body of the county or municipality or to the county enforcing agency or municipal enforcing agency, in an amount sufficient to assure the installation and completion of such protective or corrective measures as may be required by the county enforcing agency or municipal enforcing agency.

History: Add. 1995, Act 60, Imd. Eff. May 24, 1995 ;-- Am. 2000, Act 504, Imd. Eff. Jan. 11, 2001

324.9109 Agreement between public agency or county or municipal enforcing agency and conservation district; purpose; reviews and evaluations of agency's programs or procedures; agreement between person engaged in agricultural practices and conservation district; notification; enforcement.

Sec. 9109. (1) An authorized public agency, county enforcing agency, or municipal enforcing agency may enter into an agreement with a conservation district for assistance and advice in overseeing and reviewing compliance with soil erosion and sedimentation control procedures and in reviewing existing or proposed earth changes, earth change plans, or site plans with regard to technical matters pertaining to soil erosion and sedimentation control. In addition to or in the absence of such agreements, conservation districts may perform periodic reviews and evaluations of the authorized public agency's, county enforcing agency's, or municipal enforcing agency's programs or procedures pursuant to standards and specifications developed in cooperation with the respective districts and as approved by the department. These reviews and evaluations shall be submitted to the department for appropriate action.

(2) A person engaged in agricultural practices may enter into an agreement with the appropriate conservation district to pursue agricultural practices in accordance with and subject to this part, the rules promulgated under this part, and any applicable local ordinance. If a person enters into an agreement with a conservation district, the conservation district shall notify the county enforcing agency or municipal enforcing agency or the department in writing of the agreement. Upon entering into the agreement under this subsection, a person is not subject to permits required under this part, but is required to develop project specific soil erosion and sedimentation control plans and is subject to the remedies provided for in this part for violations of this part.

History: Add. 1995, Act 60, Imd. Eff. May 24, 1995 ;-- Am. 2000, Act 504, Imd. Eff. Jan. 11, 2001

324.9110 Designation as authorized public agency; application; submission of procedures; variance; approval.

Sec. 9110. (1) Subject to subsection (4), a state agency or an agency of a local unit of government may apply to the department for designation as an authorized public agency by submitting to the department the soil erosion and sedimentation control procedures governing all earth changes normally undertaken by the agency. If the applicant is an agency of a local unit of government, the department shall submit the procedures to the county enforcing agency and the appropriate conservation district for review. The county enforcing agency and the conservation district shall submit their comments on the procedures to the department within 60 days. If the applicant is a state agency, the department shall submit the procedures to the department of agriculture for review, and the department of agriculture shall submit its comments on the procedures to the department within 60 days.

(2) Subject to subsection (4), if the department finds that the soil erosion and sedimentation control procedures of the state agency or the agency of the local unit of government meet the requirements of this part and rules promulgated under this part, the department shall designate the agency as an authorized public agency.

(3) Subject to subsection (4), after approval of the procedures and designation as an authorized public agency pursuant to subsection (2), all earth changes maintained or undertaken by the authorized public agency shall be undertaken pursuant to the approved procedures. If determined necessary by the department and upon request of an autho rized public agency, the department may grant a variance from the provisions of this subsection.

(4) A state agency or an agency of a local unit of government shall not administer and enforce this part and the rules promulgated under this part as an authorized public agency unless the department has approved the agency under this s ection. An approval under this section is valid for 5 years, after which the department shall review the agency for reapproval. At least 6 months before the expiration of each succeeding 5-year period, the department shall complete a review of the authorized public agency for reapproval. The department shall approve a state agency or an agency of a local unit of government if all of the following conditions are met:

(a) The agency has adopted soil erosion and sedimentation control procedures that are at least as restrictive as this part and the rules promulgated under this part.

(b) The individuals with decision-making authority who are responsible for administering the soil erosion and sedimentation control procedures have current certificates of training under section 9123.

(c) The agency has submitted evidence of its ability to effectively administer soil erosion and sedimentation control procedures. In determining whether the agency has met the requirement of this subdivision, the department shall consider all of the following:

(i) Funding to administer the agency's soil erosion and sedimentation control program.

(ii) The agency's plans for inspections to assure minimization of soil erosion and off-site sedimentation.

(iii) The adequacy of the agency's soil erosion and sedimentation control procedures.

(iv) If the agency has previously administered soil erosion and sedimentation control procedures, the agency has effectively administered these procedures or has implemented changes in their administration that the department determines will result in the agency effectively administering the soil erosion and sedimentation control procedures. In determining whether the agency has met the requirement of this subparagraph, the department shall consider all of the following:

(A) Whether the agency has had adequate funding to administer the agency's soil erosion and sedimentation control program.

(B) Whether the agency has conducted adequate inspections to assure minimization of soil erosion and off-site sedimentation.

(C) The effectiveness of the agency's past compliance and enforcement efforts.

(D) The adequacy of the agency's soil erosion and sedimentation control plans and procedures as required by rule.

(E) The conditions at construction sites under the jurisdiction of the agency as documented by departmental inspections.

(5) If the department determines that a state agency or an agency of a local unit of government is not approved under subsection (4) or that a state agency or an agency of a local unit of government that was previously approved under subsection (4) is not satisfactorily administering and enforcing this part and the rules promulgated under this part, the department shall enter an order, stipulation, or consent agreement under section 9112(7) denying or revoking the designation of the state agency or agency of a local unit of government as an authorized public agency.

History: Add. 1995, Act 60, Imd. Eff. May 24, 1995 ;-- Am. 2000, Act 504, Imd. Eff. Jan. 11, 2001;-- Am. 2005, Act 55, Imd. Eff. June 30, 2005

324.9111 Repealed. 2000, Act 504, Imd. Eff. Jan. 11, 2001.

Compiler's Notes: The repealed section pertained to statements and certificates relating to plats.

324.9112 Earth change; permit required; effect of property transfer; violation; notice; hearing; answer; evidence; stipulation or consent order; final order of determination.

Sec. 9112. (1) A person shall not maintain or undertake an earth change governed by this part, the rules promulgated under this part, or an applicable local ordinance, except in accordance with this part and the rules promulgated under this part or with the applicable local ordinance, and except as authorized by a permit issued by the appropriate county enforcing agency or municipal enforcing agency pursuant to part 13.

(2) The owner of property that is subject to a permit under this part is responsible for compliance with the terms of the permit that apply to that property.

(3) Except as provided in subsection (4), if property subject to a permit under this part is transferred, both of the following are transferred with the property:

(a) The permit, including the permit obligations and conditions.

(b) Responsibility for any violations of the permit that exist on the date the property is transferred.

(4) If property is subject to a permit under this part and a parcel of the property, but not the entire property, is transferred, both of the following are transferred with the parcel:

(a) The permit obligations and conditions with respect to that parcel, but not the permit itself.

(b) Responsibility for any violations of the permit with respect to that parcel that exist on the date the parcel is transferred.

(5) If property subject to a permit under this part is proposed to be transferred, the transferor shall notify the transferee of the permit in writing on a form developed by the department and provided by the county enforcing agency or municipal enforcing agency. The

notice shall inform the transferee of the requirements of subsection (2) and, as applicable, subsection (3) or (4). The notice shall include a copy of the permit. The transferor and transferee shall sign the notice, and the transferor shall submit the signed notice to the county enforcing agency or municipal enforcing agency before the property is transferred.

(6) A county enforcing agency or municipal enforcing agency may charge a fee for the transfer of a permit under subsection (3) or (4). The fee shall not exceed the administrative costs of transferring the permit. Fees collected under this subsection shall only be used for the enforcement and administration of this part by the enforcing agency.

(7) If in the opinion of the department a person, including an authorized public agency, violates this part, the rules promulgated under this part, or an applicable local ordinance, or a county enforcing agency or municipal enforcing agency fails to enforce this part, the rules promulgated under this part, or an applicable local ordinance, the department may notify the alleged offender in writing of its determination. If the department places a county on probation under section 9105, a municipality is not approved under section 9106, or a state agency or agency of a local unit of government is not approved under section 9110, or if the department determines that a municipal enforcing agency or authorized public agency is not satisfactorily administering and enforcing this part and rules promulgated under this part, the department shall notify the county, municipality, state agency, or agency of a local unit of government in writing of its determination or action. The notice shall contain, in addition to a statement of the specific violation or failure that the department believes to exist, a proposed order, stipulation for agreement, or other action that the department considers appropriate to assure timely correction of the violation or failure. The notice shall set a date for a hearing not less than 4 nor more than 8 weeks from the date of the notice of determination. Extensions of the date of the hearing may be granted by the department or on request. At the hearing, any interested party may appear, present witnesses, and submit evidence. A person who has been served with a notice of determination may file a written answer to the notice of determination before the date set for hearing or at the hearing may appear and present oral or written testimony and evidence on the charges and proposed requirements of the department to assure correction of the violation or failure. If a person served with the notice of determination agrees with the proposed requirements of the department and notifies the department of that agreement before the date set for the hearing, disposition of the case may be made with the approval of the department by stipulation or consent agreement without further hearing. The final order of determination following the hearing, or the stipulation or consent order as authorized by this section and approved by the department, is conclusive unless reviewed in accordance with the administrative procedures act of 1969, 1969 PA 306, MCL 24.201 to 24.328, in the circuit court of Ingham county, or of the county in which the violation occurred, upon petition filed within 15 days after the service upon the person of the final order of determination.

History: Add. 1995, Act 60, Imd. Eff. May 24, 1995 ;-- Am. 2000, Act 504, Imd. Eff. Jan. 11, 2001 ;-- Am. 2004, Act 325, Imd. Eff. Sept. 10, 2004 ;-- Am. 2004, Act 565, Imd. Eff. Jan. 3, 2005

324.9113 Injunction; inspection and investigation.

Sec. 9113. (1) Notwithstanding the existence or pursuit of any other remedy, the department or a county enforcing agency or municipal enforcing agency may maintain an action in its own name in a court of competent jurisdiction for an injunction or other process against a person to restrain or prevent violations of this part.

(2) At any reasonable time, an agent appointed by the department, a county enforcing agency, or a municipal enforcing agency may enter upon any private or public property for the purpose of inspecting and investigating conditions or practices that may be in violation of this

part. However, an investigation or inspection under this subsection shall comply with the United States constitution and the state constitution of 1963.

History: Add. 1995, Act 60, Imd. Eff. May 24, 1995 ;-- Am. 2000, Act 504, Imd. Eff. Jan. 11, 2001 ;-- Am. 2005, Act 55, Imd. Eff. June 30, 2005

324.9114 Additional rules.

Sec. 9114. In order to carry out their functions under this part, the department and the department of agriculture may promulgate rules in addition to those otherwise authorized in this part.

History: Add. 1995, Act 60, Imd. Eff. May 24, 1995

324.9115 Logging, mining, or land plowing or tilling; permit exemption; "mining" defined.

Sec. 9115. (1) Subject to subsection (2), a person engaged in the logging industry, the mining industry, or the plowing or tilling of land for the purpose of crop production or the harvesting of crops is not required to obtain a permit under this part. However, all earth changes associated with the activities listed in this section shall conform to the same standards as if they required a permit under this part. The exemption from obtaining a permit under this subsection does not include either of the following:

(a) Access roads to and from the site where active mining or logging is taking place.

(b) Ancillary activities associated with logging and mining.

(2) This part does not apply to a metallic mineral mining activity that is regulated under a mining and reclamation plan that contains soil erosion and sedimentation control provisions and that is approved by the department under part 631.

(3) A person is not required to obtain a permit from a county enforcing agency or a municipal enforcing agency for earth changes associated with well locations, surface facilities, flowlines, or access roads relating to oil or gas exploration and development activities regulated under part 615, if the application for a permit to drill and operate under part 615 contains a soil erosion and sedimentation control plan that is approved by the department under part 615. However, those earth changes shall conform to the same standards as required for a permit under this part. This subsection does not apply to a multisource commercial hazardous waste disposal well as defined in section 62506a.

(4) As used in this section, "mining" does not include the removal of clay, gravel, sand, peat, or topsoil.

History: Add. 1995, Act 60, Imd. Eff. May 24, 1995 ;-- Am. 2000, Act 504, Imd. Eff. Jan. 11, 2001

324.9115a Earth change activities not requiring permit; violations.

Sec. 9115a. (1) A residential property owner who causes the following activities to be conducted on individual residential property owned and occupied by him or her is not required to obtain a permit under this part if the earth change activities do not result in or contribute to soil erosion or sedimentation of the waters of the state or a discharge of sediment off-site:

(a) An earth change of a minor nature that is stabilized within 24 hours of the initial earth disturbance.

(b) Gardening, if the natural elevation of the area is not raised.

(c) Post holes for fencing, decks, utility posts, mailboxes, or similar applications, if no additional grading or earth change occurs for use of the post holes.

(d) Removal of tree stumps, shrub stumps, or roots resulting in an earth change not to exceed 100 square feet.

(e) All of the following activities, if soil erosion and sedimentation controls are implemented, the earth change is stabilized within 24 hours of the initial earth disturbance, and soil erosion or sedimentation to adjacent properties or the waters of the state has not or will not reasonably occur:

(i) Planting of trees, shrubs, or other similar plants.

(ii) Seeding or reseeding of lawns of less than 1 acre if the seeded area is at least 100 feet from the waters of the state.

(iii) Seeding or reseeding of lawns closer than 100 feet from the waters of the state if the area to be seeded or reseeded does not exceed 100 square feet.

(iv) The temporary stockpiling of soil, sand, or gravel not greater than a total of 10 cubic yards on the property if the stockpiling occurs at least 100 feet from the waters of the state.

(v) Seawall maintenance that does not exceed 100 square feet.

(2) Exemptions provided in this section shall not be construed as exemptions from enforcement procedures under this part or the rules promulgated under this part if the exempted activities cause or result in a violation of this part or the rules promulgated under this part.

History: Add. 2005, Act 56, Imd. Eff. June 30, 2005

324.9116 Reduction of soil erosion or sedimentation by owner.

Sec. 9116. A person who owns land on which an earth change has been made that may result in or contribute to soil erosion or sedimentation of the waters of the state shall implement and maintain soil erosion and sedimentation control measures that will effectively reduce soil erosion or sedimentation from the land on which the earth change has been made.

History: Add. 1995, Act 60, Imd. Eff. May 24, 1995

324.9117 Notice of determination.

Sec. 9117. If the county enforcing agency or municipal enforcing agency that is responsible for enforcing this part and the rules promulgated under this part determines that soil erosion or sedimentation of adjacent properties or the waters of the state has or will reasonably occur from land in violation of this part or the rules promulgated under this part or an applicable local ordinance, the county enforcing agency or municipal enforcing agency may seek to enforce a violation of this part by notifying the person who owns the land, by mail, with return receipt requested, of its determination. The notice shall contain a description of the violation and what must be done to remedy the violation and shall specify a time to comply with this part and the rules promulgated under this part or an applicable local ordinance.

History: Add. 1995, Act 60, Imd. Eff. May 24, 1995 ;-- Am. 2000, Act 504, Imd. Eff. Jan. 11, 2001

324.9118 Compliance; time.

Sec. 9118. Within 5 days after a notice of violation has been issued under section 9117, a person who owns land subject to this part and the rules promulgated under this part shall implement and maintain soil erosion and sedimentation control measures in conformance with this part, the rules promulgated under this part, or an applicable local ordinance.

History: Add. 1995, Act 60, Imd. Eff. May 24, 1995 ;-- Am. 2000, Act 504, Imd. Eff. Jan. 11, 2001

324.9119 Entry upon land; construction, implementation, and maintenance of soil erosion and sedimentation control measures; cost.

Sec. 9119. Except as otherwise provided in this section, not sooner than 5 days after notice of violation of this part has been mailed under section 9117, if the condition of the land, in the opinion of the county enforcing agency or municipal enforcing agency, may result in or contribute to soil erosion or sedimentation of adjacent properties or to the waters of the state, and if soil erosion and sedimentation control measures in conformance with this part and the rules promulgated under this part or an applicable local ordinance are not in place, the county enforcing agency or municipal enforcing agency, or a designee of either of these agencies, may enter upon the land and construct, implement, and maintain soil erosion and sedimentation control measures in conformance with this part and the rules promulgated under this part or an applicable local ordinance. However, the enforcing agency shall not expend more than $10,000.00 for the cost of the work, materials, labor, and administration without prior written notice in the notice provided in section 9117 for the person who owns the land that the expenditure of more than $10,000.00 may be made. If more than $10,000.00 is to be expended under this section, then the work shall not begin until at least 10 days after the notice of violation has been mailed.

History: Add. 1995, Act 60, Imd. Eff. May 24, 1995 ;-- Am. 2000, Act 504, Imd. Eff. Jan. 11, 2001

324.9120 Reimbursement of county or municipal enforcing agency; lien for expenses; priority; collection and treatment of lien.

Sec. 9120. (1) All expenses incurred by a county enforcing agency or a municipal enforcing agency under section 9119 to construct, implement, and maintain soil erosion and sedimentation control measures to bring land into conformance with this part and the rules promulgated under this part or an applicable local ordinance shall be reimbursed to the county enforcing agency or municipal enforcing agency by the person who owns the land.

(2) The county enforcing agency or municipal enforcing agency shall have a lien for the expenses incurred under section 9119 of bringing the land into conformance with this part and the rules promulgated under this part or an applicable local ordinance. However, with respect to single-family or multifamily residential property, the lien for such expenses shall have priority over all liens and encumbrances filed or recorded after the date of such expenditure. With respect to all other property, the lien for such expenses shall be collected and treated in the same manner as provided for property tax liens under the general property tax act, 1893 PA 206, MCL 211.1 to 211.157.

History: Add. 1995, Act 60, Imd. Eff. May 24, 1995 ;-- Am. 2000, Act 504, Imd. Eff. Jan. 11, 20

324.9121 Violations; penalties.

Sec. 9121. (1) A person who violates this part is responsible for either of the following:

(a) If the action is brought by a county enforcing agency or a municipal enforcing agency of a local unit of government that has enacted an ordinance under this part that provides a penalty for violations, the person is responsible for a municipal civil infraction and may be ordered to pay a civil fine of not more than $2,500.00.

(b) If the action is brought by the state or a county enforcing agency of a county that has not enacted an ordinance under this part, the person is responsible for a state civil infraction and may be ordered to pay a civil fine of not more than $2,500.00.

(2) A person who knowingly violates this part or knowingly makes a false statement in an application for a permit or in a soil erosion and sedimentation control plan is responsible for the payment of a civil fine of not more than $10,000.00 for each day of violation.

(3) A person who knowingly violates this part after receiving a notice of determination under section 9112 or 9117 is responsible for the payment of a civil fine of not less than $2,500.00 or more than $25,000.00 for each day of violation.

(4) Civil fines collected under subsections (2) and (3) shall be deposited as follows:

(a) If the state filed the action under this section, in the general fund of the state.

(b) If a county enforcing agency or municipal enforcing agency filed the action under this section, with the county or municipality that filed the action.

(c) If an action was filed jointly by the state and a county enforcing agency or municipal enforcing agency, the civil fines collected under this subsection shall be divided in proportion to each agency's involvement as mutually agreed upon by the agencies. All fines going to the department shall be deposited into the general fund of the state.

(5) A default in the payment of a civil fine or costs ordered under this section or an installment of the fine or costs may be remedied by any means authorized under the revised judicature act of 1961, 1961 PA 236, MCL 600.101 to 600.9948.

(6) In addition to a fine assessed under this section, a person who violates this part is liable to the state for damages for injury to, destruction of, or loss of natural resources resulting from the violation. The court may order a person who violates this part to restore the area or areas affected by the violation to their condition as existing immediately prior to the violation.

(7) This section applies to an authorized public agency, in addition to other persons. This section does not apply to a county enforcing agency or a municipal enforcing agency with respect to its administration and enforcement of this part and rules promulgated under this part.

History: Add. 1995, Act 60, Imd. Eff. May 24, 1995 ;-- Am. 1996, Act 173, Imd. Eff. Apr. 18, 1996 ;-- Am. 2000, Act 504, Imd. Eff. Jan. 11, 2001

324.9122 Severability.

Sec. 9122. If any provision of this part is declared by a court to be invalid, the invalid provision shall not affect the remaining provisions of the part that can be given effect without the invalid provision. The validity of the part as a whole or in part shall not be affected, other than the provision invalidated.

History: Add. 1995, Act 60, Imd. Eff. May 24, 1995

324.9123 Training program; certificate; fees.

Sec. 9123. (1) Beginning 3 years after the effective date of the 2000 amendments to this section, each individual who is responsible for administering this part and the rules promulgated under this part or a local ordinance and who has decision-making authority for soil erosion and sedimentation control plan development or review, inspections, permit issuance, or enforcement shall be trained by the department. The department shall issue a certificate of training to individuals under this section if they do both of the following:

(a) Complete a soil erosion and sedimentation control training program sponsored by the department.

(b) Pass an examination on the subject matter covered in the training program under subdivision (a).

(2) A certificate of training under subsection (1) is valid for 5 years. For recertifications, the department may offer a refresher course or other update in lieu of the requirements of subsection (1)(a) and (b).

(3) The department may charge fees for administering the training program and the examination under this section that are not greater than the department's cost of administering the training program and the examination. All fees collected under this section shall be deposited into the soil erosion and sedimentation control training fund created in section 9123a.

History: Add. 1995, Act 60, Imd. Eff. May 24, 1995 ;-- Am. 2000, Act 504, Imd. Eff. Jan. 11, 2001

324.9123a Soil erosion and sedimentation control training fund; creation; disposition of funds; lapse; expenditures.

Sec. 9123a. (1) The soil erosion and sedimentation control training fund is created within the state treasury.

(2) The state treasurer may receive money or other assets from any source for deposit into the soil erosion and sedimentation control training fund. The state treasurer shall direct the investment of the soil erosion and sedimentation control training fund. The state treasurer shall credit to the soil erosion and sedimentation control training fund interest and earnings from fund investments.

(3) Money in the soil erosion and sedimentation control training fund at the close of the fiscal year shall remain in the fund and shall not lapse to the general fund.

(4) The department shall expend money from the fund, upon appropriation, only to administer the soil erosion and sedimentation control training program and examination under section 9123.

History: Add. 2000, Act 504, Imd. Eff. Jan. 11, 2001

Workplace Wellness Center

Proposal for

Bay County Area Collaborative

February, 2012

Promote health. Prevent disease. Provide a shorter path to care.

CareATC

PROPOSAL INTRODUCTION

This proposal has been developed in collaboration with Brown & Brown of Mid-Michigan.

This presentation overviews the Wellness Center provider, their experience, results and details of the analysis identifying suitability of a near-site medical facility in Bay City, Michigan.

Five employer groups have been included in this proposal;

1. The City of Bay City:	303 Eligible Employees
2. Bay County Medical Care Facility:	190 Eligible Employees
3. Bay Arenac Behavioral Health:	221 Eligible Employees
4. Bay County:	342 Eligible Employees
5. Bay Arenac ISD	156 Eligible Employees
Total Population:	1,212

Projected investment and estimated savings detailed in this presentation are for directional purposes only. A separate proposal document will be provided.

Actual investment and projected savings will be finalized in the individual contracts between CareATC and the individual employer groups.

Workplace Wellness Center Management Company

CAREATC OVERVIEW

- A 'National' Workplace Wellness Center Provider
- 13 years of Experience in Wellness Center Management
  - 10 years of data showing 'actual' client savings
  - Public & Private Sector facilities : 53 Wellness Centers in 11 States
- Expanding Business in Mid-West United States
  - Operations office in Tulsa, OK, NIS support offices across Michigan
  - Results focused organization
  - A leader in chronic disease management
- Mission & Goals Are Aligned
  - Improve employee and their dependent's health
  - Reverse rising health care costs
  - Be an efficient & effective user of public and private resources

CLIENTS FROM MOST MAJOR SECTORS

MANUFACTURING : Oil & Gas Industry
404 Eligible Employees

SERVICE : Property Management
592 Eligible Employees

MANUFACTURING : Plastic Wrap
267 Eligible Employees

SERVICE : Waste Management
134 Eligible Employees

EDUCATION : College
1,173 Eligible Employees

EDUCATION : Educational Materials
208 Eligible Employees

GOVERNMENT : City Workers
529 Eligible Employees

GOVERNMENT : City Workers
4,707 Eligible Employees

MANUFACTURING : Electrical Boxes
407 Eligible Employees

MANUFACTURING : Rubber Hose
736 Eligible Employees

GOVERNMENT : City Workers
1,181 Eligible Employees

GOVERNMENT : City Workers
778 Eligible Employees

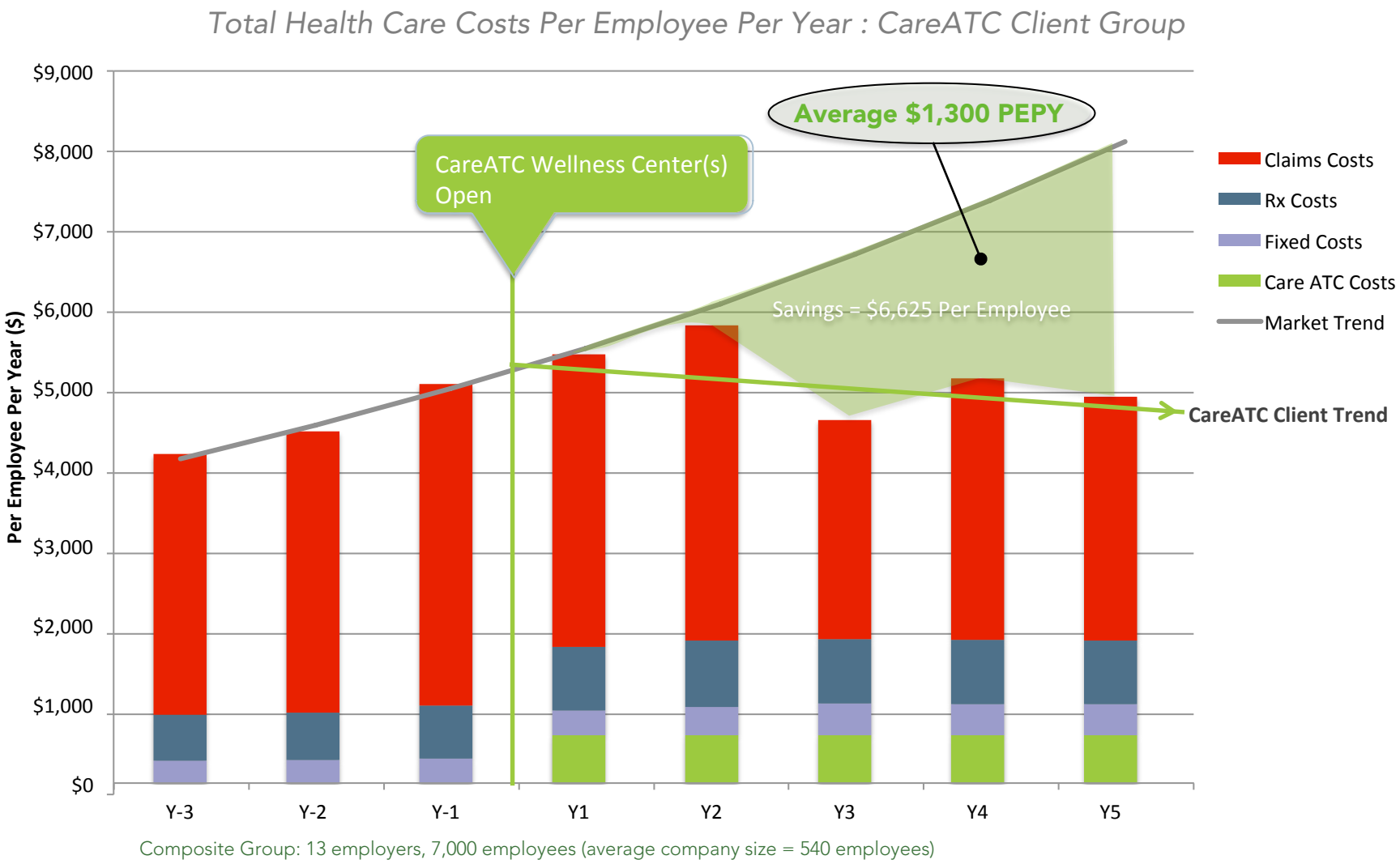
SERVICE : Recreational Services
172 Eligible Employees

SERVICE : Gas Stations
4,869 Eligible Employees

GOVERNMENT : City Workers
1,732 Eligible Employees

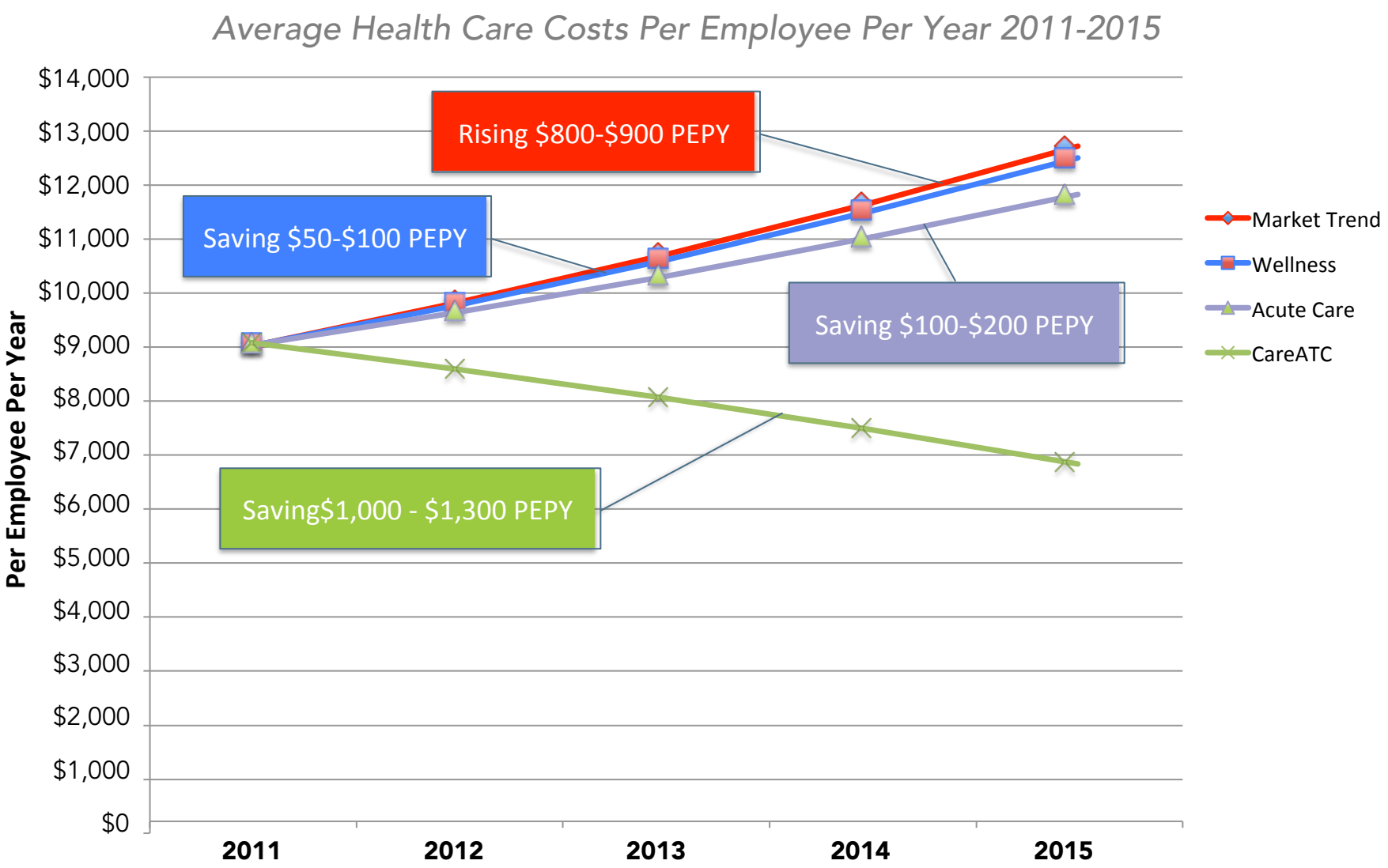
MANUFACTRUING : Air Conditioning
1,647 Eligible Employees

REVERSING THE TREND OF RISING HEALTH CARE COSTS & LARGE CLAIM ILLNESSES



Composite Group: 13 employers, 7,000 employees (average company size = 540 employees)

THE CareATC WELLNESS ADVANTAGE



How The CareATC Solution Will Work

Patient Scheduler
Web Based Reporting
Critical Call List

Step 1: Develop a Wellness Culture

- Structured programs
- Focus on chronic disease

Step 2: Personal Health Assessment

- Identify high-risk individuals
- Physicians measure patient outcomes

Step 3: Provide The Best Care 'Free'

- Eliminate all possible barriers
- Treatment can commence immediately

Step 4: Monitor & Continually Improve

- Doctor, patient and customer support

Step 5: Full Service Capabilities

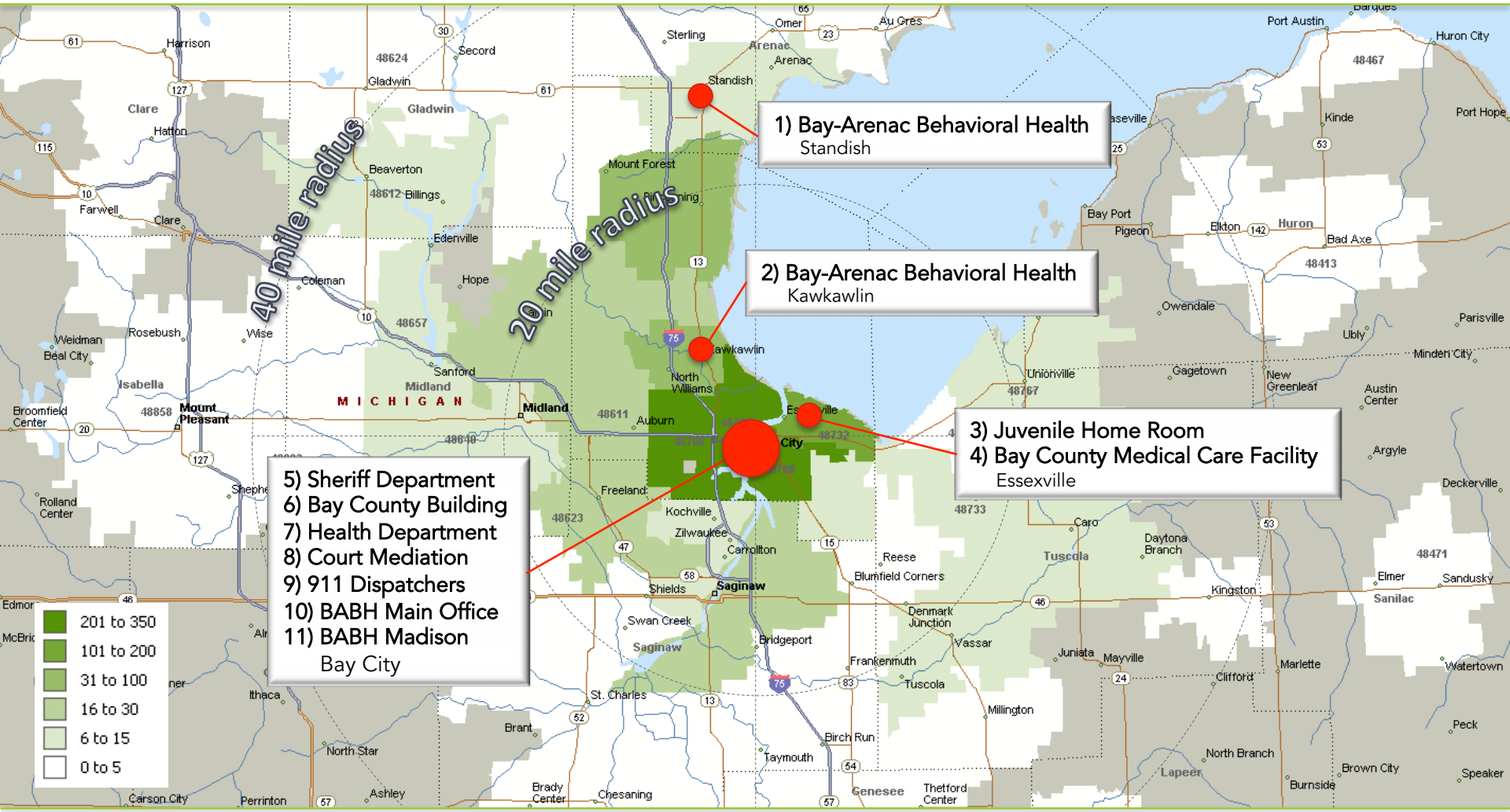
- Electronic medical records
- Claims & data entry
- Surgical management
- Wellness Center exit surveys

Site Analysis & Proposal
Bay County Area Collaborative

GEO-MAPPING OF ELIGIBLE EMPLOYEE HOME LOCATIONS

Bay County, Bay Arenac Behavioral Health, Bay County Medical Care Facility, The City of Bay City and Bay Arenac ISD

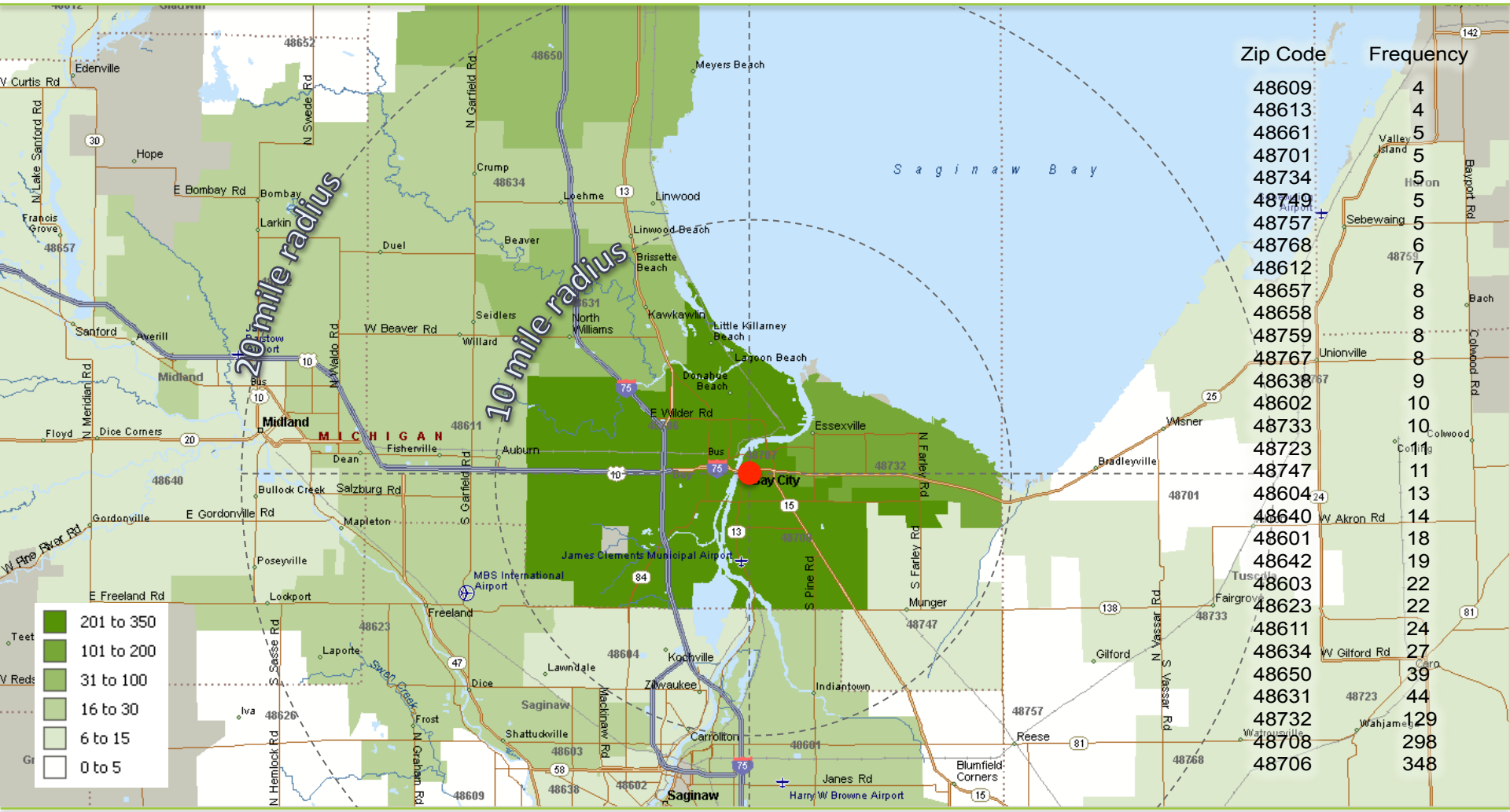
4 Major Worksite Areas, 90% Within 10 Miles of Bay City



GEO-MAPPING OF ELIGIBLE EMPLOYEE HOME LOCATIONS

Bay County, Bay Arenac Behavioral Health, Bay County Medical Care Facility, The City of Bay City and Bay Arenac ISD

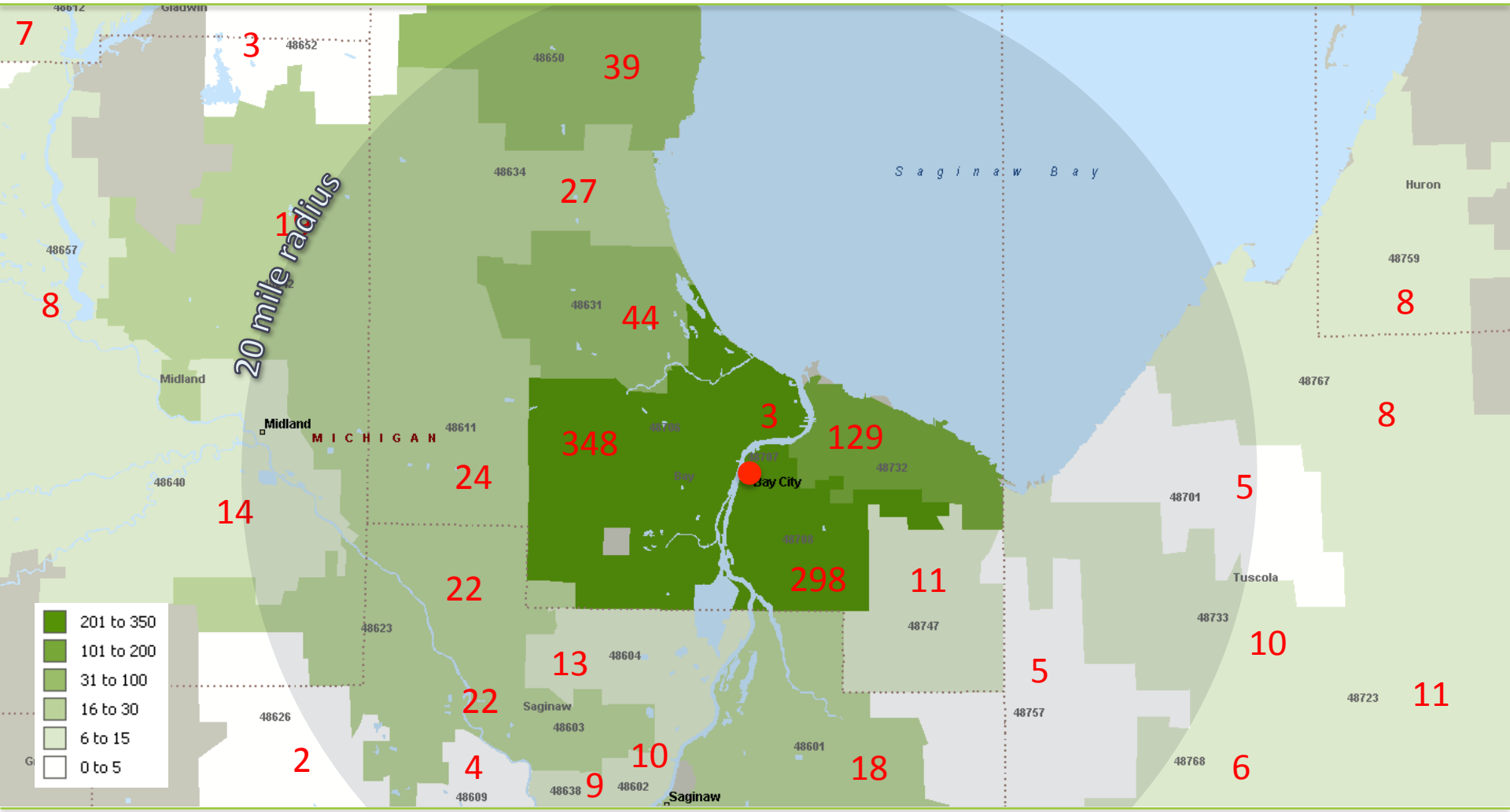
1,212 Total Eligible Employees live in 77 Zip Code Areas

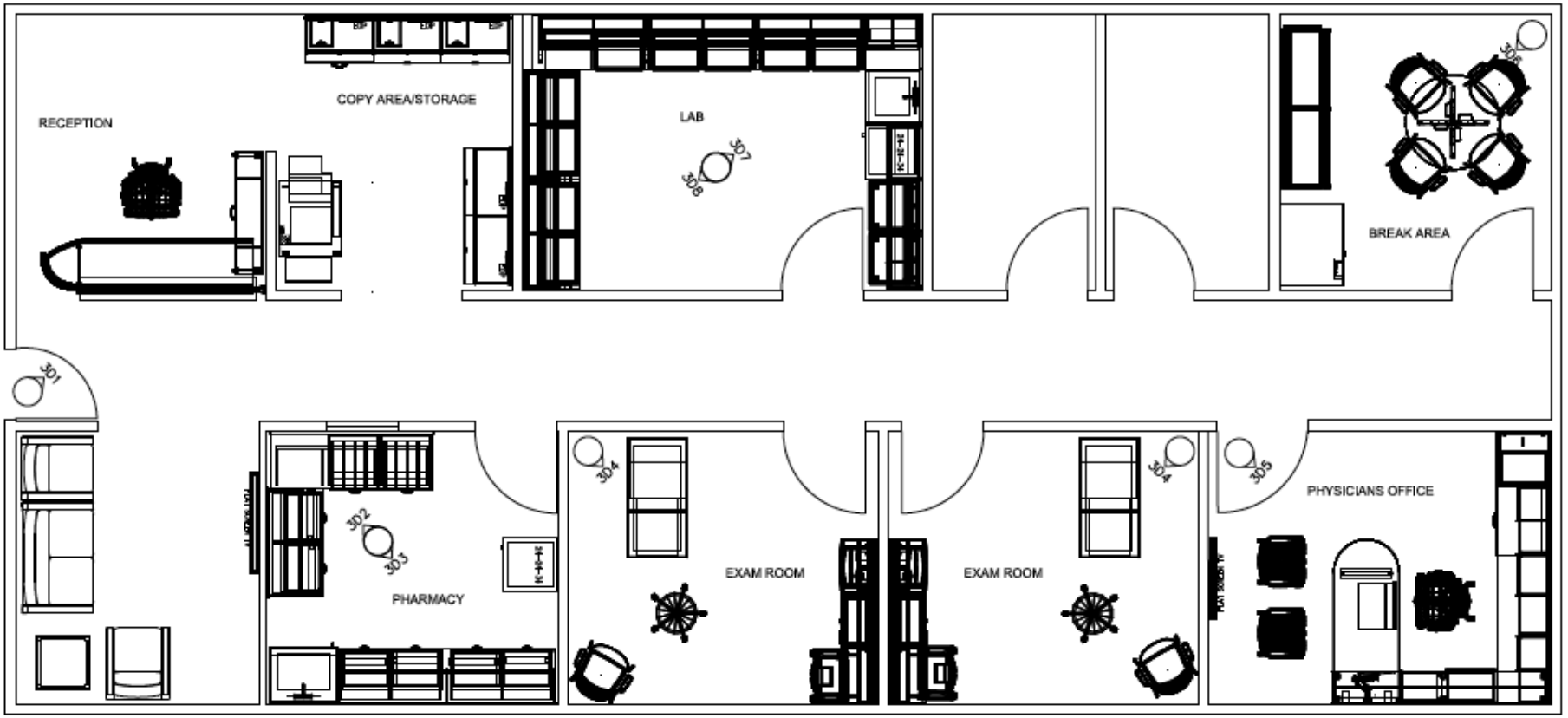


GEO-MAPPING OF ELIGIBLE EMPLOYEE HOME LOCATIONS

Bay County, Bay Arenac Behavioral Health, Bay County Medical Care Facility, The City of Bay City and Bay Arenac ISD

86% or 1,042 Eligible Employees Live within 20 Miles of Downtown Bay City





STANDARD CONFIGURATION with standard waiting area layout to be finalized by site engineer

Floor Plan Area: 1,232 sq. ft. (approximately)

PROPOSED FURNITURE PLAN
SCALE; 3/16"=1'0" (approx.)
Herman Miller Healthcare
Compass with Nemschoff Seating

Wellness Center Layout

- Standard waiting area with communication & education board/display
- Two exam rooms with center aisle, main entrance to common area
- Lab, pharmacy, reception area, break-room and physicians office

EXAM ROOM CONCEPT, FIT & FINISH

Compass from Herman Miller Healthcare

Bay County Area Collaborative - Wellness Center Overview

Opening	Proposed : July 1st, 2012				
Site	Bay City, MI				
Staffing	One physician, two medical assistants : working 32 hours per week				
Center Hours (suggested)	Monday	Tuesday	Wednesday	Thursday	Friday
	8 hrs.	8 hrs.	8 hrs.	4 hrs.	4 hrs.
Appointments	128 appointment slots/week (@ average 15 minute time slots – may be adjusted)				
Care Type	Primary, acute and wellness programs				
Reporting	Web-based reporting, critical call lists, population health status and improvements				
Drug Dispensing	Non-narcotic prescription drugs, dispensed on-site				
Medical Records	Electronic Medical Records. Transferable into and from provider networks				
Implementation	Communications, logistics, staffing, compliance, launch management				

The Wellness Center will be staffed by a credentialed physician and appropriate medical personnel, overseen and managed by CareATC Medical Directors.

CareATC will implement the program, set-up the Wellness Center, provide both on-line and phone accessed scheduling, perform an annual PHA for eligible employees and spouses, and provide primary, acute and preventive health care for the eligible population.

Patient privacy is protected, the program is HIPAA compliant, and the employer is protected from liabilities associated with the Wellness Center and medical care, both by the contractual relationship and via CareATC management.

TYPICAL IMPLEMENTATION TIME FRAME WOULD BE 90 DAYS

Time frames would be set based on information gathered during discovery with the company. Developing an offering which "fits" the company's needs is crucial to the success of the program.
The Implementation Outline indicates estimates of organizational support time needed.

WELLNESS CENTER PROGRAM COST PER YEAR

Wellness Center Hours Per Week	32
Administrative Fees – 23.95 PEPM x 1,212 Employees	$29,028.00
Staff Cost - $155/hr. x # hours per week x 4.33 (Doctor $125/Hr. 2 Med. Asst. $15 each/hr.)	$21,477.00
Estimated Supplies, Rx & Labs (Variable/Pass Through) Based on our dispensing model, not pre-packaged medication	$6,060.00
Personal Health Assessments for each participating adult 100% Participating Employees & Spouses @ $50/each	$8,080.00
85% Participating Employees & Spouses @ $62.50/each	
70% Participating Employees & Spouses @ $75.00/each	
Estimated Monthly Costs	$64,645.00
Estimated Annual Costs	$775,740.00
Total Estimated PEPM Cost	$53.34

PROGRAM PROJECTED SAVINGS

- The Wellness Center will have capacity for a full-time service hours (40 hr./week)
  - operating initially at 32 hours per week
  - 128 appointment slots/week (average)
- The projected PEPM cost is $53.34 in 2012 for 32 hr./week
- Average saving PEPY is estimated at $1,300 for five years (projected)

Projected Savings Model : 32 hours of Wellness Center time/week (straight line savings projection)

Proposal 01/25/12	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017
Wellness Center Program Cost	$775,740.00	$775,740.00	$775,740.00	$775,740.00	$775,740.00
Average Savings/year	$1,575,600.00	$1,575,600.00	$1,575,600.00	$1,575,600.00	$1,575,600.00
Net Savings (loss)*	$799,860.00	$799,860.00	$799,860.00	$799,860.00	$799,860.00
Wellness Center build-out costs**	$78,700.00	$0	$0	$0	$0
Net Health Plan Savings (cumulative)***	$721,160.00	$1,521,020.00	$2,320,880.00	$3,120,740.00	$3,920,600.00
Break-even Projection	X				

note:

* actual results may vary dependent on population illness, accident and chronic disease conditions

** does not include floor coverings or building exterior access changes (site costs may vary once location and size is finalized)

*** does not include savings in workers compensation, absenteeism or productivity gains

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